THE

ELECTRICAL REVIEW.

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ELECTRICAL REVIEW.

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(J. A. BERLY'S).

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ENGINEERING IN PUBLIC SCHOOLS.

ACCORDING to our well-informed contemporary, *Engineering*, the great public schools of this country are, one by one, adding, in response to a demand from parents, an "engineering side" to the classical, modern, and other sides which they already possess. The idea does not appear to be regarded in a very favourable light by the schoolmasters, who know quite well that the time during which the youths are under their charge is all too short for the satisfactory imparting to them of that minimum of general knowledge which every boy on leaving school is supposed to possess.

One of the greatest difficulties which the teachers in technical institutions have to contend with is the ignorance of the students who come to them fresh from school, where they are supposed to have finished their general education. A great deal of the time which ought to be given to technical instruction has to be devoted to the teaching of arithmetic and practical mathematics and kindred subjects, which are necessary to a proper grasp of technical problems. It seems a very topsy-turvy arrangement that public schools should usurp the functions of the technical college and teach engineering, whilst technical colleges should be afterwards compelled to teach the mathematics necessary to a proper understanding of engineering technology!

What does it all mean? Do parents suppose that engineering can be learnt at a public school, and that lucrative positions in the engineering industry are waiting for their sons to fill as soon as they shall have finished their schooling? If so, there will be a rude awakening.

It is safe to say that any engineering knowledge acquired at a public school will be about as useful afterwards in any engineering pursuit as a knowledge of football or cricket would be.

There is a considerable diversity of opinion as to the practical value of a workshop training in a technical college, but there can be no two opinions among engineers as to the futility of engineering training given in public schools. If the worst were that the time devoted to engineering was wasted, that alone would be bad enough, but when, as is only too well known, the time which can be given to other subjects of a more generally useful nature is far too short, the waste of time is doubly deplorable.

Engineering—including, of course, electrical engineering—is one of the most overcrowded and underpaid of the professions. For the amount of time and money sunk into a thorough engineering training the financial return is pitifully meagre. There is a glut of engineering brains on the market, and the supply has for a long time been far greater than the demand.

Let this be quite understood by the fond parent who is diverting his attention from the Church and the Army to engineering. No matter what engineering knowledge a youth may have acquired at a public school, he will have

to spend about three years or more in a technical college, where he will probably have to unlearn a good deal, and learn much of what he ought to have learnt. After that he will have to serve an apprenticeship in an engineering works, and concurrently attend advanced technical classes. At the end of it all he may be offered 10s. a week as an improver in a central station, and in two years more he will leave to make room for someone else at the same price. Then he may, if he has money, buy a directorship in some hopeless concern, or buy a brass plate and set up as a consulting engineer and wait for clients. If he is wiser, he will become a commercial traveller for some engineering house.

Workshops in schools are all very well when regarded as pastimes for those who have a taste for handicraft. A knowledge of the use of a hammer and saw is good and cannot but be useful in after life. We laugh at a woman who cannot drive a tin-tack—although she can do wonders with a hair-pin—but how many men can drive a 2½-in. cut nail home, or saw a piece of wood straight through? These things may come within the scope of general knowledge, but engineering training is specialised knowledge, and should be given by specialists after school days are done. If public schools want to teach professions or trades, which we doubt, why choose engineering, or why stop at engineering? Why not a medical side, with dissecting laboratories and operating theatres; a legal side with classes in conveyancing, advocacy, cross-examination and costing; an architectural side with bricklaying and stone-cutting workshops?

Is it that engineering is considered to be so simple that it can be spatchcocked into the ordinary curricula of the schools without sacrificing anything; or that it can be taken as an "extra" like music, half an hour a day to be given to it out of playtime? Or is it supposed that engineering is destined to become the universal profession and that we shall all become engineers instead of Socialists or Anarchists—which appear to be the most fashionable professions of the moment?

Possibly the solution of the riddle is that the medical and legal professions, being properly organised, are protecting themselves by stiffening their examinations and so making it more and more difficult for newcomers to enter.

There is no entrance examination for mechanical or electrical engineers and so we are all becoming engineers nowadays!

The Position of the Colliery Manager.

Most of our readers will join us in sympathising with Mr. John Allan, manager of the Mary Pit belonging to the Fife Coal Co., who was prosecuted by the Home Office under the Coal Mines Regulation Act at Dunfermline, a report of which case will be found on another page. The under-manager, Mr. Ramsay, was also fined, but there does not seem to be the same excuse for the latter's fault, as in the case of Mr. Allan; though it is true the prime cause of the accident—which caused the loss of three lives and severe injuries to six other men—was due to Mr. Allan's want of knowledge and experience in electrical matters. Mr. Ramsay's chief fault, however, lay in appointing, or allowing to be appointed, a youth of only 19 years of age to make an inspection for gas, who was quite incompetent for this duty, which is one of some importance and responsibility, requiring both experience and judgment.

Mr. Allan's case, however, is typical of many at the present day, and one which can only be remedied by an alteration in the law, and that is to require certificated competent engineers to take charge of the mechanical and electrical department of the colliery. The mere reading of the case is quite sufficient to convince the reader that Mr. Allan was no more to blame for this accident than the man in the moon; and we think the Fiscal's remark that "a person might just as well have given a child a box of matches and set it loose in a powder magazine" was very apt. Here we have a colliery manager approaching 60 years of age, who has held his position as underground manager for a period of 30 years, and who, no doubt, is a good, practical, and experienced "pitman"; he is in charge of two collieries 1½ miles distant from each other, and there is no question but that his time is fully occupied. He will have had some experience in steam and the ordinary mechanical plant of a colliery, but in every probability this has been limited to the collieries where he has been employed. Where was electricity in colliery working 30 years ago? Is it likely that Mr. Allan—occupied as he has been and is—could have had opportunities for studying the theory and practice of electrical engineering? He, no doubt, with his brother managers, knew that electricity was another new form of power for driving machinery, and no doubt had inspected dynamos and motors at work at other collieries, but beyond this we question whether he has any knowledge of practical electrical engineering. Yet knowing all this, his owners decide to put in an electric driven fan, and he is informed by his superior, Mr. Rowan, *where* the motor has to be placed. And that is all! What is the result? Three men lose their lives, six others are severely injured, valuable plant is destroyed, work delayed, and compensation to the tune of several thousands is claimed by the relatives of the dead and injured workmen, while to satisfy the "law" Mr. Allan is prosecuted and fined £2, with the option of 10 days' imprisonment. Was there ever such a farce? Yet the matter is very serious, and it is sad to think that Mr. Allan, after 30 years' honourable service, should at last be subjected to the slur of a police court conviction for a fault thrust upon him by his owners through an Act of Parliament made for the *protection of workmen employed in mines*. Was there ever such irony as this?

As we have on several previous occasions pointed out, these accidents are becoming much too common, and they can only be prevented by appointing competent persons to take charge of the machinery; in order to do this, present conditions must be altered so as to make it worth while for such persons to accept the appointments, and the people who would receive the most benefit would be the owners, while there is no doubt that colliery managers would welcome the relief from such responsibility, as they carry quite enough as it is.

The Audit of Supply Companies' Accounts.

It is customary for the votaries of municipal trading in electric light occasionally to stir up the mud against the private company. Those who do this wish to convince the public that the private electric lighting company cares only for the interests of its shareholders; they also desire to hide the doings of certain municipal electric lighting bodies from the public gaze. As Mr. Birrell once said: "Nothing lends greater enchantment to a landscape than a bank of clouds." The motto of the advocates of municipal trading would seem to be: "If we cannot show that our own methods are good, we can at least show that those of our opponents are bad."

It is not altogether easy to understand this attitude of criticism, except on the basis that the municipal trader looks upon the private company as dealing with property, and exercising rights, which really belong to the public. We can well understand that it is in the public interest that there shall be full disclosure of all the accounts of a municipal

body which is responsible to the ratepayers. The need for the same amount of publicity in the case of an electric lighting company is by no means apparent, nor, in our view, do the Electric Lighting Acts fall short of what is required in the public interest.

Mr. Chiozza-Money, M.P., for Paddington, is not, however, satisfied with the existing order of things, and he last week put a question to the President of the Board of Trade with reference to the audit of the accounts of electric lighting companies, to which we desire to draw attention. He asked whether the Board had decided in future to accept the audit of the lighting companies own auditors as sufficient for the purposes of a public audit under the Electric Lighting Acts; and, if so, upon what grounds such declaration had been made.

Mr. Churchill's answer was at once full and explicit. He said:—

> No, sir. There is, I think, some misapprehension as to the action taken by the Board of Trade in regard to the audit of the accounts of electric lighting companies. The Board continue to carry out their statutory duty of appointing official auditors who are specially instructed to direct their attention to the protection of the interests of the consumers and of the possible purchasing authority, and who are responsible for this audit to the Board of Trade. The official auditors appointed by the Board to audit the accounts of electric lighting companies for the year 1907 are professional accountants who are in a good many cases, but by no means in all, identical with the shareholders' auditors. This is an arrangement which I am informed avoids a certain amount of unnecessary duplication of work, though it carries with it some possible disadvantages. It has not been adopted in any case in which the local authority is empowered to purchase the undertaking at a price dependent on the amount of capital expenditure, and I will watch the progress of the arrangement carefully in case it should be necessary to make any change.

Answering a further question, Mr. Churchill said he was not aware that in one instance a public auditor, acting also for the company, had put down to capital account certain items that should have been paid for out of interest.

These answers would appear to be sufficient to explain the very reasonable action of the Board in this matter. It appears, moreover, that their action is entirely consonant with the letter and spirit of the Electric Lighting Acts. By Sec. 9 of the Act of 1882, undertakers must on or before March 25th in every year fill up an annual statement of the accounts of the undertaking made up to December 31st then the next proceeding, and such statement must be in the form and must contain such particulars, and must be published in such manner as may from time to time be prescribed in that behalf by the Board of Trade. This section clearly relates only to the form of accounts. It says nothing as to whether particular items are to be charged up to capital or revenue. One might expect to find some provision on this head in this Act, or the other Electric Lighting Acts, but there is none. Another provision relating to the accounts of electric lighting companies is to be found in Sec. 6 of the schedule to the Electric Lighting Act, 1899, ss. (1) of which provides that the annual statement of accounts shall be examined and audited by such competent and impartial person as the Board of Trade appoint, and the remuneration of the auditor shall be such as the Board of Trade direct, and that remuneration and all expenses incurred by him in or about the execution of his duties, to such an amount as the Board of Trade approve, must be paid by the undertakers, and are to be recoverable as a civil debt. It also provides that the Board of Trade may make regulations as to the time and mode of the audit, but it does not enumerate the powers of the auditor, nor does it, so far as we can see, enable him to deal with the question whether any particular disbursement shall be charged to capital or to revenue.

The undertakers must give to the auditor, his clerks and assistants, access to such of the books and documents relating to the undertaking as are necessary for the purposes of the audit, and shall when required furnish to him and them all vouchers and information requisite for that purpose, and shall afford to him and them all facilities for the proper execution of his and their duty. The Board have power to make and vary regulations prescribing the times at and the mode in which such audit shall be made and conducted, or otherwise for the purpose of giving effect to the provisions of this section. A report made by the auditor, or such portion thereof as the Board of Trade direct, must be appended to the annual statement of accounts, and must form part thereof for the purposes of Sec. 9 of the Electric Lighting Act, 1882.

Unless it can be shown that a particular company has been guilty of appointing an auditor who will serve its turn, the selection of two to do the work of one would appear to be an absolute waste of money. Mr. Money's suggestion no doubt is that some company is preparing for the day of compulsory purchase; but the fact that the President of the Board of Trade knows of, and approves, the present system of auditing should be sufficient guaranty that he has some confidence in the integrity of those who manage these companies.

Our Annual Tables.

The Table of Electricity Works of the United Kingdom, which accompanies this issue, is noteworthy mainly for the small number of new works included—less than a score—a fact arising from several causes. Almost every town of corporate dignity, and almost all the larger urban districts, as well as many municipalities of minor rank, are provided with works for the supply of electricity, the total numbering well over 400; many of those not thus equipped are supplied with electricity by power companies, or by neighbouring cities, and lastly, financial considerations have militated against the further outlay of capital on the part of municipal authorities—though there never was a time when electrical plant could be obtained at rates so cheap as those now ruling.

Little progress, apparently, is made by the majority of the power companies—several of them exist but in name, and more than one is in liquidation or in course of reconstruction. Only one new railway appears in our list issued last week, and the number of tramways also has practically come to a standstill.

Returning to the sheet issued to-day, we have noted with interest comments on the part of several central-station engineers to the effect that their percentage increase of connections has been reduced to a small, or even a negative, quantity by the general adoption of the metallic-filament lamp. The change has also had the effect of rendering the effective value of the lamp connection uncertain, except where a new lamp census has been taken. No doubt this factor will exercise a material influence upon statistics—and revenue—for some years to come.

On the other hand, in a very great number of towns, metallic-filament lamps are in use or on trial on an extensive scale for public lighting; and the fact that they are able to compete successfully with gas for this purpose, as well as for indoor lighting, goes far to neutralise the adverse effect which they will exercise for a time upon the lighting load. The power demand also continues to increase, and to many engineers the lessened altitude of the lighting peak, enabling them to develop their motor load to a greater extent before installing new plant, will prove a real benefit.

The familiar "equivalent 8-c.p. lamps" in the early days gave, no doubt, a fair idea of the magnitude of an undertaking, but nowadays it is meaningless. The equivalent value of an 8-c.p. lamp has never been authoritatively settled, so that values ranging from 30 to 35 watts are in use. To get away from this inaccurate and indefinite unit, which has already been abandoned by several important undertakings, we have this year adopted the kilowatt partially, and in future will use it entirely. For the purpose of conversion, we have used an average value of 33⅓ watts, making 30 lamps to the kilowatt. Comparison between station plant capacity and load connected then becomes easy, and a far more definite idea of the latter can be obtained, though it must be admitted that the quantity measured itself is not capable of very precise determination.

Where the date to which the particulars are made up has been given on our forms, we have included it in the "Remarks" column; but in many instances it is not stated, though the data have been revised up to the latest possible period. The absence of such date, therefore, does not imply that the particulars are out of date.

In conclusion, we must express our indebtedness to the engineers and managers of electricity works, through whose courtesy the compilation of such tables is made possible.

CORRESPONDENCE.

Letters received by us after 5 P.M. on Tuesday cannot appear until the following week. Correspondents should forward their communications at the earliest possible moment. No letter can be published unless we have the writer's name and address in our possession.

Are Consulting Engineers Necessary?

I have read with very considerable interest the discussion on this subject which has taken place in your columns, and your recent contributor, "An Observer," has anticipated the comment I intended to make.

It has occurred to me, however, that this discussion may serve a more useful purpose if you will allow me to broaden its scope and to review briefly the present position of the consulting fraternity. I refer particularly to those gentlemen who are consulting engineers wholly and solely, and who act in that professional capacity with the hope and intention of making a living thereby. By way of parenthesis, I may be wrong in describing them collectively as a "fraternity," and it may be *infra dig* to assume for a single moment that they have any grievance to ventilate. Hence this letter may be a gross piece of presumption.

In the first place, the consulting engineer has no trade union, and, therefore, he cannot be dealt with collectively. The Institution has prescribed for him individually, and a special Committee has drawn up and issued the following rules of etiquette, which, of course, are always strictly observed:—

1.—No consulting engineer should solicit employment as consulting engineer verbally, by letter, by agent paid by commission or otherwise, or by any other means.

2.—No consulting engineer should answer advertisements for consulting engineers.

3.—No consulting engineer should advertise for employment.

4.—No consulting engineer should pay by commission or otherwise anyone who introduces clients.

5.—No consulting engineer should receive trade or other discount, or surreptitious commissions or allowances in connection with any works which he superintends.

6.—A consulting engineer who is also directly or indirectly interested in any contracting or manufacturing business should inform his client in writing what his connection is with such contractor.

It will be seen that these rules preclude the consulting engineer from employing any of those little devices for "landing the fish" which are so dear to the heart of the contractor, such as dinners to municipal committees, showing councillors round London, week-end parties for golf and such like pursuits, motor rides and "the Continong." The consulting engineer does not, and must not do, any of these things, and on a strict point of etiquette he should not even breathe the faintest whisper into the ear of his closest friend about being retained to advise on any scheme. Hence it must be admitted that even under the most favourable circumstances he has to take his chances.

In addition to these very wise and necessary restrictions, the consulting engineer often finds his special functions usurped by the contractor and the manufacturer, who are ready enough to pour ridicule on the profession when it suits their purpose. This fact is so well known that it need not be enlarged upon.

Again, his professional brother, the architect, will supplant him without the least compunction, with the results so excellently described on page 318 in your issue for August 23rd, 1907.

I break in upon the subject here by asking why cannot this glaring and reprehensible practice be dealt with by the Institution of Electrical Engineers in conference with the Royal Institute of British Architects? It would have had attention long ago if it had affected the commercial instead of the professional side of electrical engineering.

One could, of course, enlarge on similar cases, but I will conclude by pointing out one other aspect, and, in my opinion, the most objectionable of all.

Everyone is aware of the many instances, which have occurred with great frequency, in which gentlemen holding important and highly paid salaried appointments, are called in to advise and draw up reports on electric lighting and tramway undertakings, and to act as consulting engineers to mill owners and power users. These gentlemen are municipal electrical engineers, Government officials and tramway managers.

One is tempted to ask how far this sort of thing is consistent with the existence of the Institution, which looks after the consulting engineer so well in other respects. Is it fair to the man who has given up his salaried appointment to risk his reputation and his capital in consulting work, to find himself thus cut out by his old colleagues?

It appears to me that the etiquette of the consulting electrical engineer is an altogether anomalous code under these circumstances, and no wonder. There is no other profession which is so indifferently one-sided in its concern for the welfare and dignity of its members.

Your discussion inquires "Are Consulting Engineers Necessary?" but I would ask, "Can the consulting engineer continue to exist?"

The last few years have not been especially fat ones, and the boom is largely over, and there exists the greater necessity to-day for a firm expression of true *camaraderie* amongst the members of the profession and some attempt to protect the interests and livelihood of the *bonâ fide* consultant.

Verbum Sap.

Norwegian Water-Power Legislation.

The announcement from Christiania, in your issue of June 5th, 1908, that the Norwegian Government propose to modify their new Bill in such a manner as not to differentiate so sharply between Norwegian and foreign companies, may be good enough of intention so far as the present Government and its supporters are concerned; but, from the point of view of the great trading body of the country, such a modification would spell financial disaster complete. Already their leading trade journal has pointed out in no half terms that the recent restrictive proposals have, to a considerable extent, hindered the influx of foreign capital into their country. Yet, by placing Norwegian ventures on a similar, or nearly similar, footing to those of foreigners, any loophole for the introduction of foreign capital in that direction is effectually blocked—which is presumably the intention of the Government. Rightly or wrongly, the opinion is pretty generally current that the committee now sitting for the purpose of "modifying" the late Government's proposals, are at work on suggestions of a far more restrictive nature than those hitherto advanced; and, unless the word "modify" is to be understood in its most genial sense, it is difficult to perceive in what other direction the old proposals could be modified in order to undo the mischief their very appearance has wrought. The new proposals, as modified, will doubtless be ready for discussion by the Storthing in its next session, and, after the stormy reception predicted for them, they may, or may not, become law. But there is a general presentiment that the whole business will be either quietly shelved, or relegated to public vote at the next General Elections.

Vasdrag.

Norway, *June 19th*, 1908.

Radium Stones.

Since I addressed you upon the above subject, I have made many further experiments, which are interesting, but do not solve the curious phenomena.

1. With some stones, when pressure is applied, such as a setting around them, the colour and brilliancy disappear.

2. The colour in such cases can be restored by a fresh exposure to radium, but the colour is rarely what it was before the stone was set. In these instances the colour appears to be permanent.

3. Remarks under 1 and 2 hold good for when the stones are warmed.

I attributed the effects, namely, loss of colour, &c., to the fact that such stones had not really changed in colour, but that they fluoresced for a considerable time, in the end returning to their normal state. This does not appear to be the case, for all the usual tests for fluorescence failed. It would therefore appear as if the apparent increase of dispersive and refractive power were real, since pressure

or heat restores the original condition of the stones, as might to some extent be expected. Possibly in cases where the colour, &c., are not impaired by the above processes, it is due to the fact that the pressure or heat required would destroy the stone, and in a few cases I reached the critical points.

David Salomons.

London, W., *June 18th*, 1908.

The Future of Steam-Electric Power Plant.

With reference to one of the leaders in your last week's issue, the authority being "Power," the first portion opens by stating that the cost of installing steam plant has been so reduced that it is now more economical to install this kind of plant than to harness water-power and transmit to a distance.

It is quite evident that the author has utterly lost sight of, or was not cognisant of the fact, that there has been corresponding, if not greater, improvements in harnessing water-power. Now, a modern 50-H.P. turbine working on a ring-ball-bearing suspended in an oil-bath (which arrangement I was the first to adopt), when working night and day, would not use more than two-penny-worth of oil in a week. How does this compare with steam and gas engine practice? I must admit that the views expressed are those now prevailing in the British Isles, though not in America and in Europe, where the harnessing of new water-power is the fashion, not the exception, as it is with us. A mistaken notion exists that there is no water-power of any amount in the British Isles, whereas if all the obtainable water-power was made the best of, there would be sufficient to generate half the energy now obtained for public use, and this would mean an immense saving in coal. Now, if this saving were accomplished, two decided advantages would be gained, the price would be kept down and the supply prolonged. It is an unquestionable fact that the coal supply of Great Britain is becoming exhausted, on this point I am thoroughly with the author of the article; the other alternative for prolonging the supply is the efficient utilisation of poorer quality fuel, by using up culm or spoil-bank waste, which at present is neglected.

As bearing out the foregoing remarks, Manchester last year paid £9,000 more for its coal for electric supply purposes, through increase in price, not in quantity; it is now on the point of spending £130,000 to install more plant to use up more coal, consequently increasing price and helping on final exhaustion—whereas, within a 15-mile radius, sufficient water-power could be obtained to give the Corporation some 25,000,000 to 30,000,000 units yearly; this would mean a clear saving of some £50,000 to £60,000 per annum.

Now, I maintain that Manchester is not alone in this respect. In fact, it is truly deplorable how short-sighted public bodies are in not availing themselves of water-power, for the advantages are unquestionable. In the first place, there is no drawing on capital or touching reserve, only possible to use interest, as water-power is perpetually renewable. There is only one drawback with water-power—unreliability.

W. Antrobus.

Manchester, *June 22nd*, 1908.

Public Lighting of the City of London.

We notice in the current issue of your Journal that, under the above heading, you give particulars of the report made by Mr. A. A. Voysey to the Streets Committee of the Corporation of London, and it may interest your readers to know that all the flame arc lamps employed, from which the curves are taken, are our "Oriflamme" long-burning flame lamps. We notice that no mention was made of the make or type of lamp in the excerpts which you have made from Mr. Voysey's report.

Oliver Arc Lamp, Ltd.,
WM. M. D. PELL, *Director.*

Woolwich, *June 22nd*, 1908.

THE PURCHASE OF COAL ON A SCIENTIFIC BASIS.

WRITING in *Cassier's Magazine*, Mr. J. B. C. Kershaw points out how unscientific has always been the method of purchase of fuel, one of the essentials in modern manufacturing enterprise; coal is an article which costs £81,000,000 annually for the total consumed at home in Great Britain, and of this five-sixths is used in industry. Coal is often bought by a trial of a wagon load, but the means of testing subsequent deliveries are totally inadequate. Every coal has its own peculiar characteristics in respect of size, of draught, moisture, and so on; very different results in efficiency may be obtained according to the atmospheric conditions prevailing, and much depends on the fireman.

Then, after a sample wagon has been approved, what proof has the user that he always gets his coal from the same seam or the same colliery?—and so one might continue the criticism of methods and probabilities.

Needless to say, the author recommends the chemical testing of fuel. First it is necessary to determine the combustible and incombustible constituents and the moisture. The latter is driven off by a two hours' exposure to a temperature of 230° F. The volatile matter and sulphur may then be determined by retorting at a red heat in a closed crucible.

The solid carbon is found by further heating of the coke in an open crucible or dish, and what is left is ash or incombustible residue. Such a test can be made in three hours, and the calorific value of the coal can be calculated, or it can be experimentally determined, but the calculation is probably more accurate than most ordinary calorimetric tests, for in unskilled hands the calorimeter is a difficult instrument to use.

A few examples of tested coals are given as an illustration, and it is pointed out how a low ash content is valuable, if only because there is less stuff to cart away. Nor should it be forgotten that a large quantity of ash results in the loss of coal by the inclusion of combustible cinders with the clinker. Ash also retards combustion. By testing a coal it is found how much has really to be paid for potential heat units. The tests show how many heat units there are in a ton of coal, and the cost of this ton is made up of the price of the coal delivered, the wages of the fireman, the cartage of ash, and the cleaning of the boiler flues and grates. The fireman's wages will apply to all coals, but it might happen that the labour involved was, or soon might be, too much for one man, and a bad fuel might involve heavier labour costs. From the figures given, it appears that the price of British thermal units in Lancashire is fully 3d. per million units, while some coals work out at nearly 4d., and that prices are not by means conformable with calorific value. The cheapest coal, with nearly 11 per cent. of ash and over 7 per cent. of moisture, proved cheapest per thermal unit, but the order went to a coal with less ash, and costing more per thermal unit, a compromise that was probably dictated by the cost of ash cartage, and the pernicious effects of too much ash.

A few clauses are given from an American fuel contract form, whence it appears that the price finally paid varies with the calorific value determined. In Chicago there is a separate organisation for fuel sampling, and many coal users put their fuel supply in the hands of this organisation.

It is presumed that British coal merchants would object to such modern methods. Probably they would, for from a considerable experience in the ways of coal sellers, one is disposed to think that some of them rely on payments to firemen, under the head of coal money, and upon influence with the directors of companies. Often the position of an engineer striving after economy is not a pleasant one, for he has to put up with inferior fuel, because someone is interested.

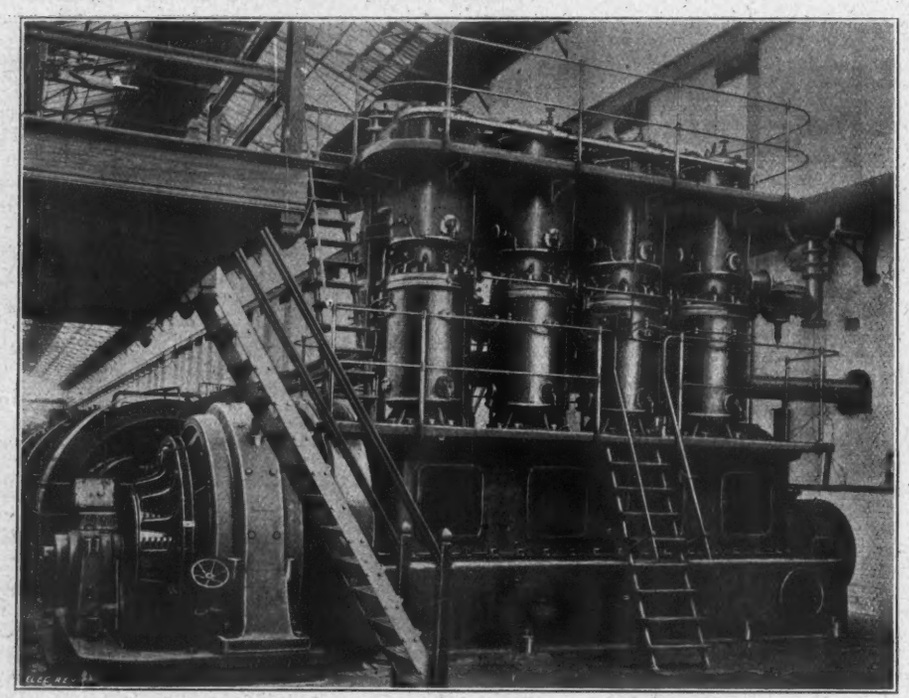
West Ham.—Negotiations are proceeding between the B.C. and the East Ham and Ilford authorities with regard to through running on the Romford Road tramways route.

1,000-B.H.P. VERTICAL GAS ENGINE AT RUNCORN.

On 6th inst, at the works of the Castner-Kellner Alkali Co., Ltd. Runcorn, a 1,000-B.H.P. gas engine was started up by Mr. Percy Allen, engineer to the company.

The engine, which is of the latest standard vertical type, was supplied by the British Westinghouse Co., and is connected to a direct-current generator supplied by the same makers. It forms an extension to the existing installation at Runcorn, where four 750-B.H.P. engines of the same type have been in operation for some considerable time in connection with the electrolytic process of the above firm.

Some idea of the 1,000-B.H.P. engine may be gained from the accompanying illustration. It will be noticed that the cylinders, in pairs, are placed over four cranks, by which arrangement the makers claim that they can give the most even turning moment of any gas engine on the market. No water-cooling is used for the pistons, valves or other moving parts, thus avoiding any danger of breakage of pistons, which is often a source of trouble in connection with large horizontal engines. Forced lubrication is used throughout, the oil pumps being in duplicate, and these can be examined and the oil sieves changed whilst the engine is in operation. All valves are positively operated by means of straight push rods actuated directly from the cam-shaft. These are also arranged with adjustable screws, so that any play or wear can be taken up on these valves, whilst the engine is in operation.



Westinghouse 1,000-B.H.P. Vertical Gas Engine at Runcorn.

The installation of this engine may be said to mark an epoch in the gas-engine industry, as it is the largest vertical gas engine yet manufactured and put into successful operation.

In addition to the five Westinghouse engines of this type now installed at the Castner-Kellner works, three of 750 B.H.P. capacity have been supplied to Messrs. Pilkington Bros., St. Helens, for their glass works, and one of 750 B.H.P. to the Hollins Mill Co., Marple, which has been working for some considerable time operating their cotton mill. Visitors to the Franco-British Exhibition will have noticed one of these large engines in the right-hand corner of the Machinery Hall. This engine runs in conjunction with a Parsons turbine, and supplies electric current to the Machinery Hall. Those who are interested in gas-engine work should take advantage of the opportunity thus afforded of inspecting this example of a leading British type of gas engine.

Bury (Lancs.).—The T.C. has reduced the price of energy as under:—Private lighting: Offices, banks, warehouses, places of worship, schools, and other short-hour users, from 4d. to 3½d. per unit; shops, from 3½d. to 3d.; hotels, public-houses, private houses, clubs, and other long-hour users, from 3d. to 2½d. Motive power: The initial charge of 2d. per unit for the use of the maximum demand for an average of one hour per day, or for 1,000 units per quarter, reduced to 1½d., with 1d. per unit for the next 1,500 units per quarter, and ½d. per unit beyond.

PARLIAMENTARY.

London Electric Supply Bill.

On the resumption of the sitting of Lord Cromer's Select Committee of the House of Lords on Tuesday, June 16th, the case of the London Electric Supply Bill was gone into. This is a Bill affecting the following companies:—Brompton and Kensington Electric Supply, Central Electric Supply, Charing Cross, West End and City Electricity Supply, Chelsea Electricity Supply, City of London Electric Lighting, County of London Electric Supply, Kensington and Knightsbridge Electric Supply, London Electric Supply, Metropolitan Electric Supply, Notting Hill Electric Lighting, St. James' and Pall Mall Electric Light, South London Electric Supply, South Metropolitan Electric Light and Power, and Westminster Electric Supply. The object of the Bill is to provide for the constitution of a Joint Committee of representatives of the companies, which body shall generate and supply electricity for power purposes.

Mr. Balfour Browne, K.C., said the Bill was promoted by eight of the existing companies, and according to their view, what they suggested offered the best scheme for affording a cheap supply of electrical energy for power purposes. The idea was to utilise the existing resources of the companies upon which some £14,000,000 of capital had been expended. The proposal in the Bill was to concentrate the generating of electricity for London into six convenient existing stations, four of which were on the River Thames, and which offered every facility for a cheap coal supply. In the second place, the Bill provided for the ultimate transfer to the London County Council, or some other authority, of the whole unified system at the termination of a certain period. By the utilisation of the existing plant, the greatest economy would be effected, and it was proposed that the benefits which would accrue should be shared with the consumers much on the same principles as had been applied in the case of gas legislation. It was proposed to constitute a joint committee of the representatives of the eight companies, and if local authorities so desired they could be represented on this committee. If that were done, then the joint committee would be a *quasi* public body. Each of the representat ves of the eight companies would have a vote, as would also the representatives of the local authorities, and in addition a further vote would accompany each amount of £10,000 guaranteed. The Joint Committee would be under an obligation to supply electricity to the various companies and local authorities. For a time the Joint Committee would not have works at which to generate for themselves, but they would be supplied from existing stations, and the price would be fixed by a standing arbitrator. Power was, however, taken in the Bill for the erection of buildings in five years time for the generation of 27,000 kw. The plant would be erected by the companies, and the Joint Committee would pay for the work done on agreement or arbitration terms. Two of the companies had placed at the disposal of the Joint Committee over 11,000 kw. The capital proposed for preliminary work and trunk mains was £1,000,000, and this was guaranteed by six of the companies. He anticipated that with the guarantee of dividend-paying companies there would be no difficulty in raising the money at 4 per cent. With regard to the revenue of the Joint Committee that would in the first place be distributed in the payment of interest on the generating stock. Secondly there would be the creation of a sinking fund on the basis of 42 years, and next 2 per cent. would go to the generating company. Beyond a profit of 6 per cent. the amount would be shared between the generating companies and the authorised distributors in the proportion of two-thirds to the latter. The promoters believed, so far as the demand was concerned, that an additional 23,000 kw. would be sufficient, and they considered that the demand would come mainly from the authorised distributors. If, however, a railway entered into a contract with the Joint Committee, special plant would be provided. They did not expect a demand for tramway purposes.

The average increase in the demand for power had been 9,799 KW. annually, and by combination it was anticipated that spare plant now standing idle could be utilised to meet emergencies. It was intended to use the large stations for the ordinary demand and utilise the smaller stations for the peak load. The six principal stations of the Joint companies which would be used were as follows:—

Site.	Company owning station.	Present capacity KW.	Additional KW. that can be erected by committee in existing buildings.	Area of site acres.
Bow ...	Charing Cross Co. ...	16,000	10,000	7·1
Bankside ...	City of London Co....	24,900	nil	3·0
Wandsworth	County of London Co.	8,500	10,000	1·8
Deptford ...	London Electric Co....	17,250	4,000	3·5
Willesden ...	Metropolitan Co. ...	16,500	7,500	18·0
Blackwall Point	South Metropolitan Co.	6,000	3,000	2·75
		89,150	34,500	36·15

Of the 36·15 acres, 14½ acres were now unoccupied by buildings. As the companies and local authorities had their own local areas of supply, there would not be the loss that accompanied the conveyance by mains over a long distance. The engineers of the companies had come to the conclusion that the way to solve the problem of a cheap supply was by the methods proposed in the Bill, viz., by utilising existing buildings, laying down trunk mains, and connecting the stations capable of carrying a load of 30,000 KW. By this means they believed that the growth in the demand for electric power in the next five or six years would be met. Mr. Browne proceeded to deal with the figures and tables put in by the promoters of the Bill, which had already been before the Committee, and he contended that a bulk supply station at Barking would have no advantage over the four existing stations of the promoting companies on the river. A table which had been prepared from the accounts of the 17 authorised distributors in London showed the average proportions which the various items of cost bore to the total cost of supplying the consumer, to be as follows:—(*a*) Capital charge on power station on a 7 per cent. basis, 26·7 per cent.; (*b*) coal, 16·2 per cent.; (*c*) works costs, including coal, 27·6 per cent.; (*d*) capital charge on distribution, 28·5 per cent.; (*e*) distribution costs, including wages of mains department and meter readers, rents, rates and taxes, and general charges, 17·2 per cent.; total, 100 per cent. Table IV had been prepared, showing the comparative capital costs of plant and transmission mains for supplying a load of 25,000 KW. from steam turbine plant erected (*a*) at the Barking site by a new company, and (*b*) on some of the existing companies' sites, viz.:—

	A. New company's station at Barking. Three sets 12,000 KW.	B. Plant on companies' existing sites. Six sets 5,000 KW.
Land, buildings, riverwork and coal store	£186,500	£60,000
Plant	234,950	300,000
Transmission system...	521,850	396,958
	£943,300	£756,958
Engineering and contingencies at 10 per cent.	£94,330 at 7½ %	£56,700
Preliminary expenses	100,000	30,000
Total	£1,137,630	£843,658

The comparative working costs of the two schemes in Table IV were:—

Maximum load on works	25,000 KW.
Units generated...	101,400,000
Load factor at works	46·3 %
Diversity factor...	1·11
Maximum load delivered to consumers ...	23,875 KW.
Total of consumers' maximum loads	26,500 KW.
Units delivered to consumers...	97,350,000
Consumer's average load factor	41·8 %

Working Expenses.	A.	B.
Coal	£67,800	£82,460
Water, oil and stores	2,110	4,220
Wages at stations	4,250	7,500
Repairs	4,110	7,630
Wages on transmission system	3,000	2,500
Management, insurance, rents, rates and taxes	25,000	15,500
	£106,270	£119,810
Capital charge to cover interest, depreciation and reserve fund at 8 per cent....	£91,010 at 7 %	£59,056
	£197,280	£178,866
Cost per unit delivered as untransformed energy	·486d.	·441d.
Maximum prices in London and District Co.'s Bill at 41·8 per cent. load factor on basis of their Table No. 9	·447d.	

With regard to the items of coal, water, oil and stores, wages at stations, and repairs under (*a*) the figures were taken at rates proportional to the estimated figures in the London and District Co.'s table, although under the conditions assured, if they were correct for the load of 60,000 KW. they would be exceeded at the load of 25,000 KW. The next table showed the capacity and capital cost of the Joint Committee's scheme for supplying a total load at the power stations of 25,000 KW., viz.:—Plant capacity—exisiting plant available in the company's stations, 10,000 KW.; new steam plant, 20,000 KW.; total, 30,000 KW. Capital cost—new steam plant, £240,000; transmission system, £376,002; engineering and contingencies, £46,200; preliminary expenses, £30,000; total, £692,202, or £23·1 per KW. Table VII showed the capacity and capital cost at a later stage of the Joint Committee's scheme for supplying a total load at the power stations of 34,000 KW., supplied from existing steam plant, new steam plant and gas-driven plant, viz.:—Plant capacity—existing plant available in the company's stations, 10,000 KW.; new steam plant, 20,000 KW.; gas-driven plant, 12,000 KW.; total capacity, 42,000 KW. Capital cost—steam plant, including extra buildings, £240,000; gas-driven plant, including engines, generators, producers, auxiliaries, sidings and buildings, £204,000; transmission system, £396,958; engineering and contingencies, £63,072; preliminary expenses, £30,000; total, £934,030, or £22·2 per kilowatt. A further table gave the working costs of the Joint Committee's new plant as dealt with in Table VII which showed that the estimated cost per unit delivered as untransformed energy to be ·383d., as against the estimated cost per unit delivered as untransformed energy for the new company's station at Barking of ·486d. The promoters asked for a modification of existing purchase powers, and two dates for purchase were provided—viz., 1932 and 1982. The purchase would be effected by the London County Council, or other authority authorised by Parliament, by redemption of the Joint Committee's stock *minus* the amount of the sinking fund. The authority would have the option of purchase in 1932, and if they exercised it they would have to give compensation for loss of profit to the Joint Committee between 1932 and 1952 to be determined by arbitration. In conclusion, Mr. BROWNE said that if the promoters were given their Bill there was a *bonâ fide* intention on their part to exercise the powers.

MR. J. S. HIGHFIELD, who with Mr. C. P. Sparks, is acting as joint engineer to the promoters, examined by MR. CRIPPS, said that as a matter of economy, so as to enable a cheap supply to be given to power users it was desirable to utilise the existing distribution mains. Assuming that there were some 200,000 power users, and they obtained one-half that number as customers, he thought a total amount of plant at the works of some 23,000 KW. would be sufficient to supply the whole. It was found that roughly 1 KW. of plant at the works was sufficient to work roughly 4 KW. of connected motor load, owing to the fact that all the motors did not run at full load at the same time. He thought a special plant should be put up to supply railways. There was a sufficient quantity of energy to supply the present demand. The aggregate of kilowatts in the Charing Cross station at Bow, the City of London at Bankside, the County of London at Wandsworth, the Kensington and Notting Hill companies at Wood Lane, the London Co. at Deptford, the Metropolitan Co. at Willesden, and the South Metropolitan at Blackwall Point, and the Central Co. at Grove Road, was 101,270 KW. Witness was then examined at length on the figures quoted by Counsel in opening, and he bore out Counsel's statement.

Continuing, WITNESS said that there was a great deal of doubt as to what type of plant they would be putting down in the near future.

In your view is it likely that gas engines will come into working for electric supply?—I think there is no question of that; they are used to some extent already for the public supply. Several small stations are already using them, they are being used to a very large extent in certain industrial works, and I think there is no doubt whatever that for a certain portion of the load, what I call the solid part of the load, gas engines will be used in the early future.

The gas engine costs rather higher originally, but is more economical in working?—Yes.

Witness, continuing, said that the Charing Cross Co. were putting down internal combustion engines burning a very heavy oil; they were not quite gas engines; they were working those plants at one of their sub-stations in order to supply the solid part of the load. They were carrying out in experiments which would cost some £30,000.

Have you worked out the cost of production by means of the oil engine?—After allowing for a charge of 8 per cent. on the capital cost of the plant and guaranteed working cost, the total comes out at ·39d. per unit when the engines are working at the high load factor of 80 per cent. That was a very low cost of generation. The same thing applied to gas as to oil engines. They were being used on a very large scale now. There were records of some 300 engines exceeding 1000 H.P. each in size; there were 40 firms building engines of that size. They estimated that the cost per KW. per hour per unit of energy was 1·7 lb. of coal on the gas engine principle, as against the estimate of 2·5 lb. of coal at the Barking site. In addition they got a bye-product by using gas engines, which was very valuable in itself.

LORD LAMINGTON: Do you propose generating the gas yourself?—Yes, to produce the gas with gas producers.

MR. CRIPPS: Of course that would make an enormous difference in the cost of coal and the generation of electricity?—Yes, that would reduce the cost very largely. The way the bulk supply would be worked was by concentrating on the six stations. There would be ample security of supply, because every important centre

would get a duplicate supply from two stations, and in most cases the supply would run both ways from the two stations.

WITNESS was then cross-examined by MR. BLENNERHASSETT, K.C., on behalf of Westminster City Council, by Mr. Rigg for the City Corporation and by Mr. Williams representing the Stepney Borough Council.

MR. WEDDERBURN, K.C., representing Croydon, said that as the Bill now before the Committee was not the same as the previous one, inasmuch as it did not propose to compete against the will of the local authority, he did not propose to cross-examine witness. Counsel would not take any part in preamble, but reserved his right to discuss the clauses.

MR. BALFOUR BROWNE, K.C., said that when he finished his opening address, he meant to have extended an invitation to their Lordships to see the generating stations of the existing companies. He would suggest that the members of the Committee should see the Bankside station, which belonged to the City Co., the station at Bow, the property of the Charing Cross Co., or the Metropolitan Electric Co.'s station at Willesden.

In answer to MR. TALBOT, WITNESS said that the parties were agreed as to the necessity of a bulk supply, but the question was, how was it to be given?

MR. HARPER, on behalf of Middlesex County Council, examined Witness as to what provision had been made for Middlesex, and he admitted that they had made no provision for that county.

MR. CLEASE (L.C.C.) intimated that he would not cross-examine Witness.

In re-examination, MR. HIGHFIELD said that their stations were as favourably situated on parts of the river as the proposed station at Barking would be. He did not think it would be the right thing to forestall at the present moment what they proposed in six years' time. He thought it would be wasting their money to carry out a 60,000 or 100,000-KW. scheme to-day.

Replying to the CHAIRMAN, WITNESS said it was intended to raise £1,000,000 in capital. They would at first supply the area within the companies own districts, and afterwards would make extensions to deal with the outside area.

MR. J. CONACHER, general manager of the Metropolitan Electric Supply Co., examined by MR. JONES, said that the restrictions under which the companies were placed by not being able to join together, had resulted in various separate systems being formed. The Bill which the companies were now promoting, would remove those restrictions, and enable them to band together for their mutual benefits. They had offered seats on the Joint Committee to the other authorised distributors, and they had also offered the L.C.C. two seats on the Committee. They were not restricted, as Mr. Talbot had stated they were, from acquiring lands, premises, or buildings for the purpose of extending their stations. They also had a free hand to select which of the London companies they would extend. The Joint Committee had agreements with five companies stating that they would use their best endeavours to get the promoters' Bill passed, and to supply them with current should they require it. The County Company agreed to provide for an extra supply of 10,000 KW. at their generating station at Wandsworth within five years. Any extension made at a particular station would be the property of the Joint Committee, but it would be worked as a part of the station which was extended. He did not think there was any difficulty in an arrangement of the sort proposed by the Bill. Under the agreements with the companies they had power to utilise and erect in all plant to the total capacity of 52,000 KW.

THURSDAY, JUNE 18TH.

At the resumption of the Committee, MR. CANE, representing the Marylebone Borough Council, cross-examined MR. CONACHER. Witness said that it was their intention at some stage to use the stations of the local authorities. He admitted that the authorities would be under the control of the companies so far as votes were concerned. Of course the authorities could appeal to the Board of Trade. Their one object was to supply energy at the cheapest possible price. They would give the same representation to any local authority, however big or little they might be. The authorities could not be forced to come in.

In reply to the CHAIRMAN, COUNSEL said that his point was that the distributing authority had no voice in the appointment of the standing arbitrator, and he thought they should have some consideration in that respect.

Continuing, WITNESS admitted that the local authority could only appeal to the Board of Trade when it concerned them. Questions of general policy would be decided by the votes of the Committee.

In reply to MR. MORTON (West Ham), MR. CONACHER said that there was nothing in the Bill which enabled the Charing Cross Co. or the Joint Committee to compete with West Ham. He was quite willing to exclude any docks situated entirely within the precincts of the borough.

Replying to MR. WILLIAMS (for Stepney), WITNESS said he was quite willing to exclude tramways, railways and docks entirely in the boundary of the borough.

COUNSEL said that he could not understand why, under the Bill, companies should claim individual powers, irrespective of what would be conferred upon the Joint Committee.

MR. CONACHER explained that two of the companies already had power to supply in West Ham, and it might be convenient that companies should give a direct supply without calling upon the Joint Committee to do so.

Continuing, WITNESS said they did not want to take a single customer away from anybody. Under their Bill, the maximum price to consumers of over 5 KW. was £4 10s. per KW., and ½d. per unit.

MR. HARPER, representing Middlesex County Council, questioned WITNESS as to what provision would be made for districts outside London. Mr. Conacher said he did not think they could confine a portion of their Willesden station distinctly for the area outside London.

Replying to questions by the Committee, MR. JONES, for the promoters, said that, at the first meeting of the Joint Committee, the six companies would be represented, with one vote each. Should the local authorities be present at that meeting, they would have a vote. It was, therefore, quite possible that, should there be more local authorities than companies, that they would have more power.

Arising out of questions by the chairman, MR. CONACHER, said that their Bill was decided upon before the London and District Bill was heard of. Whatever the fate of the London and District Bill, it was their intention to proceed with their Bill.

Replying to the CHAIRMAN, WITNESS said that he did not think, if both the Bills passed, that they would be absolutely destructive to each other.

MR. J. B. BRAITHWAITE was the next witness. Examined by MR. HUTCHINSON, he said he was senior partner of the firm of Messrs. Foster, Braithwaite & Co., and chairman of the City of London Electric Co. and the County of London Electric Co. He had for the past 11 years been considering the question of the electrical supply of London. The present Bill was the outcome of that consideration. They considered that it was an equitable and the best solution of the problem for the supply of electricity to London. On the ground of capital expenditure their scheme was an advantage, inasmuch as they would not have to lay down mains, buildings, or plant. All they required was £1,000,000 to link up the various undertakings. They would unify the system and supplement the present work, having due regard to the expenditure already incurred.

Answering the CHAIRMAN, WITNESS said he thought that they had brought forward a comprehensive scheme. It would be some time before the whole of their area was built over.

Continuing, MR. BRAITHWAITE said he agreed with MR. HAMMOND that the existing companies had done their work splendidly. There had been a great growth in the electrical industry. There was a growth of something like 9,000 KW. annually, and that could be met by the resources of the companies, supplemented by the powers that that Bill would give. The way in which they had done their work was evidenced by the fact that they had gradually been reducing their prices.

The CHAIRMAN: Do I understand that the Bill solves the question for the next 25 years?—Yes, for London. The £1,000,000 which they would raise under the Bill would last them for about five years, when they would have to come to Parliament for further powers.

Continuing, WITNESS said that in his opinion it showed the question on fair and reasonable terms, having regard to the interests of all concerned. He thought it was better to supply from alternative routes, so as to keep up a continuity of service. The promoters expected ultimately to be supplying from six or eight generating stations, thus giving a security of service. Their scheme would have nothing in the way of watered capital, therefore the ultimate purchasing authority would not have to pay for an expenditure which had not actually been incurred. The object of the Bill would bring about a unification of supply, thus minimising the inconvenience in the various different systems of supply.

COUNSEL: Does the Bill bring about economy in capital, in plant and in transmission?—Obviously it does.

Further answering COUNSEL, WITNESS said there would be a considerable saving in transmission, as they could supply a consumer from the nearest station. As regarded capital, he thought the security was ample. The six companies at the end of 1907 had a surplus, after paying interest on debentures, of £377,294, so that there should be no difficulty in raising money at 4 per cent. to allow sufficient to cover the interest 10 times over if need be. If the Bill were passed they would immediately take steps to put the powers in force.

In reply to the CHAIRMAN, WITNESS said it was obligatory upon them to form a joint committee. Continuing, Mr. Braithwaite said that the two companies he was Chairman of, had capital equal to 42 per cent. of the total amount sunk by the six companies in electrical undertakings. He thought it was unreasonable that a new company should be allowed to come in considering that the existing companies had done all the pioneer work. The existing companies had been restricted in developing the industry owing to the obligations put on them by Parliament. They asked for those restrictions to be removed so that they could develop the industry.

Lord WELBY observed that he did not think Parliament was to blame, but rather the local jealousy existing between the authorised distributors.

Continuing, WITNESS said he would urge upon the Committee the fact that an enormous amount of capital had already been expended; the promoters had had bad experience.

MR. FREEMAN, cross-examined witness at length as to the purchase clause.

Arising out of a question by Mr. Freeman, MR. BALFOUR BROWNE said that as the Bill stood the purchasing authority would have to pay £110 for every £100 issued plus the goodwill, but when he opened the Bill, he understood it was to be redeemed at par.

MR. FREEMAN, continuing, pointed out that if capital was issued at £80, and the purchasing authority had to pay £100 for it, therefore, they would be saddled with £20 in every £100 of watered capital.

MR. W. F. FLADGATE, chairman of the Charing Cross, City and West End Co., gave evidence. He said he had been chairman of a Joint Committee of the greater number of existing companies

which had sat for the last two years. The present Bill was promoted by a small joint-stock company which was registered, and he was chairman of it. The intention to promote the Bill was determined upon entirely independent of the promotion of the London and District Bill. He had carefully considered the question of the supply of electricity to London ever since Mr. Mern's Bill was introduced. In common with the other companies he had made a canvass of the supply to London, and he was satisfied that the existing companies were doing their work satisfactorily.

In reply to Mr. Rigg, Witness said that the main object of the Bill was to bring forward a scheme which solved, without an enormous expenditure, the present condition of the electric lighting industry.

Answering Mr. Thomas, Mr. Fladgate, said the Bill was carrying out the recommendations of Mr. Luke White's Committee. He thought that a few thousand pounds would be necessary to start the scheme—£200,000 or £300,000. Whatever benefit a consumer got would be derived through an authorised distributor.

Mr. Balfour Browne intimated that that closed his case for the promoters.

Mr. Morton, representing the West Ham Corporation, in the course of his address to the Committee, remarked that of the two Bills that had been before the Committee, his council preferred the present. If the promoters would agree not to compete with the Council for the supply of energy to the docks, the only question that remained was that of clauses.

Friday, June 19th.

On the Committee resuming, the Chairman said the Committee desired to be quite clear as to the intention of the purchase clause. He took it that under Clause 29 the Joint Committee would be enabled to purchase, lease, or take over any generating station or works of any company or authority within the area. That would mean practically the whole undertaking.

Mr. Cripps said the words were not intended to go so far as that. The definition of generating station and works excluded distribution and distributing mains, and limited the work to the generating side.

The Chairman asked whether Clause 43 dealing with transfer, meant purchase under Clause 29.

Mr. Cripps agreed that that was so.

The Chairman said that under Clause 43, if a public authority proposed to purchase the undertaking of the Joint Committee in 1932, the authority would have to redeem at par the stock issued by the Committee, plus the estimated profit of the Committee over the next 20 years. If a public authority wished to act in 1932, two contingencies were possible. In the first place, the Committee might not have bought out that company, and he wished to know what would be the result. The public authority would have to pay the sum required to redeem any part of the stock issued by the Joint Committee plus the compensation for loss of profit, and would also have to pay the then value to the company. A more probable contingency would be that the company had sold its undertaking to the Committee, and the sale to the public authority would not be at the then value; the purchasing authority would have to pay off the Joint Committee stock, plus the compensation between 1932 and 1952.

Mr. Cripps said that would be so, but the matter was being very carefully considered.

The Chairman said it would be an enormous advantage to a company to sell to the Joint Committee.

Mr. Cripps pointed out that any such transaction would be subject to the consent of the Board of Trade, and further the promoters would be limited by the amount of their capital.

Sir Ralph Littler, K.C., addressed the Committee on behalf of the Corporation of London. Counsel reminded the Committee that they had the power to purchase the two companies serving in the City (the City of London Co. and the Charing Cross, City and West End Co.) in 1914. The Bill before the Committee, he contended, would seriously interfere with that right of purchase. When the other Bill was before their Lordships, he challenged the promoters to find a consumer of over 250 kw. They did not produce one, but the present promoters had found three. He did not attach great importance to that, as there was really no room for great factories in the city—the land was too valuable and rates were too high. The Corporation's first objection to the Bill was the fact that the laying of the mains in the City would mean a serious dislocation of traffic. Apart from that, there was no room for the mains. Another objection was that the promoters had power to acquire existing undertakings, and, of course, that would take away their power to purchase them. The clauses in the Bill were extraordinarily unfair to the body whom he represented. There was nothing in the Bill which gave them compensation or right of exchange for the loss which they would sustain at not being able to acquire an undertaking. It took away all their safeguards which were granted to them by Parliament. The only object that he could see was that at the end of the tenure of the promoters, the companies would benefit.

In answer to Lord Lytton, Mr. Rigg said that the City would not be affected under the powers taken in the Bill to link up the stations, so long as the mains were kept out of the City.

Mr. Blennerhassett, K.C., in his address to the Committee on behalf of the Urban District of Willesden, dealt at length with the various Acts of Parliament that had been passed. The Acts were granted to the North Metropolitan Electric Co., and under them the Council of Willesden could enter into an agreement with the company for a supply of electricity. They, however, were not in the area of the North Metropolitan Co.—the company could only supply them at the request of the Council. They were now under a seven years' agreement with the company.

Replying to Lord Lytton, Counsel said there was no precedent when a Bill was before Parliament for putting them permanently into anybody's area.

Mr. Blennerhassett, continuing, said that they had never been in the North Metropolitan area, they never wanted to be, and it was never contemplated that they ever would be within the area. Under the Bill, a Council could not go to a Joint Committee and take a supply from them without the consent of the authority supplying in their area, which, in their case, was the North Metropolitan Co. They asked that they should be able to go to whoever they could obtain the most advantageous terms from. But, as he had said, the North Metropolitan Co. had a veto on them.

Mr. Cripps (for the promoters) remarked that, at the end of their (the Willesden Council) agreement with the company they would have a free hand.

Mr. Blennerhasset said that was not how he read the clause. It appeared to him that the Council could not go to the Joint Committee without the consent of the authorised distributor supplying in their area. If it was as Mr. Cripps said, then he submitted that the words of the clause were very misleading and ambiguous.

Mr. Bush, K.C., on behalf of the four companies—the Kensington, St. James', Notting Hill and Westminster Companies—said he would not call any witnesses or offer any opposition to the promoters' Bill. So far as the principle of the Bill was concerned—the associating of the existing companies for mutual benefit—it was similar to his Bill, and had their entire support.

The Chairman: Clause 45 in this Bill, broadly speaking, covers the principle of your Bill?—Yes, my Lord.

Continuing, Counsel said they had an objection to the purchase clause, but he would leave that to his learned friend, Mr. Blennerhassett, who would deal with it in his address on behalf of the Westminster Council. Subject to those grounds, and apart from them, their sympathy was entirely with the promoters.

The case for Marylebone B.C. was then proceeded with.

Mr. E. R. Debenham, Chairman of the Electric Lighting Committee, in answer to his counsel, Mr. Cane, said that it was obvious that under the arrangement as proposed for forming the Joint Committee, the local authorities would always be ruled by the companies. He considered that the local authorities should have greater representation, and also a share in the guarantee. He did not think that they could enter into a guarantee under the present state of the law, and, therefore, he thought a protection of that kind should emanate from the Board of Trade and not under a private Bill.

Arising out of a question by the Chairman, Counsel explained that their contention was that the Joint Committee would not be a semi-public body, as the companies would always be in a position to over-ride the local authorities.

In answer to Mr. Cripps, Witness said that if the promoters guaranteed the same power to the local authorities as to the companies in the formation of the Joint Committee, it would meet his difficulty to some extent. He would be satisfied if powers were given to the minority to bring a question before the arbitrator. In his opinion some such body as the Board of Trade or other public body should fix the prices, and not, as was done in the Bill, the promoters. Replying to Lord Lytton, Witness said they did not object to the preamble of the Bill.

Mr. Lewis Coward, K.C., said that although the London County Council had not specifically cross-examined witnesses on the question of the Joint Committee, yet they were strongly opposed to it, and did not desire to be represented on it.

Mr. Cane, addressing the Committee, said that his counsel opposed the Bill with considerable reluctance, because they considered it was framed on the right principles in which the question should be dealt with,—that was to utilise the existing stations, and they thought it was to the interests of the public that the management of the electrical industry of London should be in the hands of a semi-public body. They agreed with the contention of the promoters that those who had borne the pioneering work should be allowed to get such advantages as there were. He believed rather in the strengthening of foundations than of demolishing them. The votes allowed to the local authorities was purely illusionary, as the companies would always have more power. It had been said that they could appeal to the arbitrator, but then they could only do that when the question particularly affected them; questions of public policy could not be bought collectively by the local authorities before arbitration. Then, again, the arbitrator was to be appointed by the Joint Committee, and as the companies would be the ruling power, it would really be the companies' arbitrator. It had been said that the scheme would bring about a unification of systems, but he had not yet heard how that unity was to be brought about. Another important question was that all the local authorities were to be placed on the same footing irrespective of their size, and other considerations. Marylebone had a very large undertaking, and they contended that they should have greater weight than some of the others. He submitted that the Joint Committee, which would control the electrical undertakings was not a semi-public body, which his Council considered it should be. The Committee adjourned.

The Committee sat again on Monday and Tuesday, and on Wednesday announced its decision regarding both Bills. We report their finding in our "Notes" this week.

Electrification of Railways.—Mr. Chiozza Money last week gave notice of the following question which he intended to address to the President of the Board of Trade:—"Whether his attention has been directed to the fact that the Prussian State Railways Administration is about to electrify some parts of its system; if, in the interests of British trade and locomotion, he can direct the

attention of British railway companies to the fact; and if, in the event of British railway companies neglecting to avail themselves of electrical power, he will, in the public interest, introduce legislation to nationalise British railways in order to make them as efficient and as economical as those possessed by our greatest commercial rival."

Royal Assent.—The Royal Assent has been given to the following Acts:—

Edinburgh Corporation (Tramways, &c.) Order Confirmation Act, 1908.
Loch Leven Water-Power Order Confirmation Act, 1908.
Tramways Order Confirmation (No. 1) Act, 1908.

Second Reading.—In the House of Lords on June 18th, the Central Ireland Electric Power Bill was read a second time.

Liverpool Corporation Tramways.—The Select Committee of the House of Commons, presided over by Mr. Corrie Grant, has passed the clauses in the Liverpool Corporation General Powers Bill, authorising the Corporation to construct and work a tramway in the Urban District of Litherland, which is beyond the limits of the city, but which will be in connection with the existing system. Borrowing powers of £2,900 are allowed in respect of the tramway.

BUSINESS NOTES.

Warner Steering Control.—On Monday next, at 11.30 a.m., at the Head Tramway Depôt, Greengate Street, Plaistow, an opportunity is to be given to anybody interested in the matter to attend a demonstration with a car equipped with the Warner steering control of the Warner Engineering Co. Some reference to the event will be found among our advertisements to-day.

Consular Notes.—RUSSIA.—The British Vice-Consul at Baku, in a recent report, states that the demand for all classes of machinery was fairly brisk at the oil-fields during 1907, and it is satisfactory to note that the imports of British material compare favourably with those of the last few years. Until lately nearly all electrical appliances were supplied by Germany, but in 1907 several British firms entered the market with fair success. Electrical power has been considerably used on the oil-fields, its great advantage being economy of space. Lately, however, a rival to electrical motors has appeared in the form of natural gas motors.

GERMANY.—The Austrian Consul at Liepzig, in a recent report, states that the steam engine industry had not a great lack of work during 1907, although the new commercial treaties made export trade more difficult; for instance, German steam engines cannot any longer contend with the high rates of duty leviable in Austria. In Russia, also, trade is more difficult. In spite of the greater productive capability of Germany, as compared with Russia, the difference in price of Russian machines without duty and German machines, plus duty, gives the trade to the Russian product, particularly in heavy machines. The motor industry was fully occupied throughout the whole of the year; the demand was chiefly for fixed and half-fixed motors for small industries and agriculture. In the dynamo machine industry the conditions were good both for inland and external trade. The electro-technical industry enjoyed unbroken activity, but conditions were not so generally good as in previous years, and it would appear that the height of prosperity has been passed, competition is more keen, and as a result prices were forced down. The installation of electric light has made considerable progress, but power installation, particularly in small industries, is almost stationary. The electro-technical industry was much perturbed by the increased price of copper.

INDIA.—A German contemporary, in a recent issue, states that electric lighting plants are to be installed in Jubbelpore and Barrackpore, as well as in parts of Burdwan and Manbhum. The concessionaires for the first two are Kilburn & Co., of Calcutta, and for the two latter Hoare, Miller & Co. The Maharadja of Gwalior has obtained permission for the construction of electric tramways, the electric lighting of the streets and for the supply of electrical power for the three municipalities which constitute the chief town of the State of Gwalior. It is also proposed to supply cheap electric power to private undertakings. The concessionaire is the Ajmer Import and Export Co., Ajmer, Radjputana. In Kashmir electric plant is being installed which will produce 20,000 H.P., and will be the greatest in India. It is intended for lighting the town of Srinagar, for heating the silk factories, as motive power for dredging works in the River Jhelum, for railways, wool and oil works, and other undertakings; moreover, 8,000 to 10,000 H.P. could be transmitted to the Punjaub for lighting Abbottabad and Rawalpindi, for motive power for factories, and possibly, also, for the working of railways. Some time may elapse before this work is completed.

NORWAY.—In a recent report the British Vice-Consul at Bergen writes as follows:—"Of possible trade openings I would draw attention to such as are likely to occur through the increasing application of water power to electrical purposes. The district, is, however, a scattered one, with a long coast line, and what appears to be wanted is the appointment of energetic local representatives who from the nature of their private business are likely to hear of new undertakings before the particulars are generally known here, and who can be first in the field with offers from British firms. The readiness of Norwegians in general to deal with British firms of repute is a factor that should be utilised to the full. I think it is hardly realised at home that in Norway the east and west are divided not only geographically, but also by differences due to commercial rivalries and interests. While the west of Norway looks out towards the United Kingdom, the south and east are liable to come into more immediate touch with German and Danish interests, and it is impossible to shut one's eyes to the rivalries that arise from the commercial, political and historical traditions of, for instance, Christiania and Bergen. Under these circumstances, it may, perhaps, be understood that I have heard expressions of surprise here that British firms have seemingly a tendency to appoint sole agents for Norway at the capital, or only sub-agents here, instead of appointing independent agents for the east and for the west at Christiania and Bergen respectively. As an instance of the results of this tendency, I can cite a case in which a large British firm formerly represented here by a well-known agent with unusually good facilities for obtaining orders, who felt unable to continue as the firm's sub-agent when a head agent was subsequently appointed over him at Christiania; and he later accepted a German agency in the same line, Germany thus acquiring a useful agent to our disadvantage. Still less does there appear to be a reason for appointing a man resident in Sweden or Denmark, as is sometimes the case, as agent for West Norway, especially since Norway is now an independent State. A case came under my notice recently in which the fact that a tender from a British firm came through an agent in Denmark was nearly the means of losing the contract, owing to the disinclination of the buyers to deal through a man not resident here, and whom it would therefore be harder to bring to account in case of disputes arising. Whatever we may think of the justifiableness of commercial rivalries and prejudices in favour of local resident agents, the fact remains that they are there, and should be taken into account if we wish to push trade. The Bergen district alone is larger than England and Wales together, and from a practical commercial point of view the districts of Stavanger and Haugesund, from their geographical position, could conveniently be added to the sphere of action of a separate agent for the west coast of Norway. The new railway to Christiania will no doubt bring east and west into closer touch, but even then it is, perhaps, only natural that buyers, especially in the case of municipal contracts, should prefer to deal with an agent easily accessible rather than with a man 300 miles away at Christiania, or even in an adjoining kingdom. If any difficulty is experienced in obtaining an agent, the Bergen Agents' Association is always prepared to submit applications to its members."

POLAND.—The British Acting-Consul at Warsaw reports that the number of telephone subscribers in Warsaw is rapidly increasing. Within the course of six years the number has increased by 414 per cent., and amounts now to about 11,000. As the central telephone stations is only constructed to provide for 13,000 members, it is proposed to erect another station in the near future. Manufacturers and merchants complain of the fee, which is £7 a year, and efforts are being made by them to have it reduced to £3. The Warsaw-Lodz line is little used, as it is often more convenient to use the telegraph; 75 c. is paid for three minutes' talk. Besides this it is difficult to talk, as the Lodz telephones are of an old type. The authorities have taken up the matter, and it is intended to supply the line with new telephones.

It was expected that the electric trams would run at the end of last year, but there has been much delay, and there is still plenty of work to be done, although the rails are already laid almost everywhere. The total number of tramcars will be 200.

In the second half of the year the larger streets were illuminated by electric light; but these works also were much delayed, and the electric company asked the authorities for a postponement up to July, 1908. The company themselves sustained losses by the delay amounting to £1,700.

Electric lighting was introduced at Warsaw by degrees, at first only in 40 streets where the rails for electric trams were laid. In view of this the output of gas considerably diminished. The gasworks, however, did not dismiss their men for fear that troubles might ensue, but the number of working days per week was reduced to four. At the same time the gas company decided to extend gas lighting to the outskirts of the town where no electric light has been installed. The administration of the gasworks at Lodz has succeeded in getting the agreement with the town prolonged to 1909. The yearly production of gas at Lodz is estimated at 200,000,000 cb. ft., 30 per cent. of which is consumed by street lamps. As Lodz is rapidly growing, it is proposed to erect a new gasworks at a cost of £100,000.

Training Ship "Exmouth."—On Saturday the Metropolitan Asylums Board decided to provide a battery of electrical accumulators on the training-ship *Exmouth* (cost £275). It is estimated that this will reduce the maintenance account by £50 per annum at least.

Marylebone Publicity.—We have already referred in these pages to the commercial development enterprise of the Marylebone Electricity Supply Department. We have now received a batch of publications which have been issued by Mr. F. A. Wilkinson and his commercial staff for stimulating the interest of the potential consumer in the area. The chief of these publications is a 50-page book with stiff covers, in which there appears a fully-illustrated account of the station and sub-stations, the head offices and commercial department. Some retrospective notes concerning the undertaking are published, and other matter

deals with the rates of supply, the progress of the system, and gives a list of the contractors to the Council. The various small pamphlets, all of which are got up very attractively, are entitled "Electric Lighting," "Domestic Electricity," "The New Electric Lamps," "The Electric Sign," "Electric Heating and Cooking," "The Cost of Power," and a circular to ratepayers drawing the reader's attention to the readiness of the Department to place themselves at his disposal.

York as an Industrial Centre.—From the Town Clerk of York we have received a 24-page red-covered brochure entitled "Aspects of the City as an Industrial Centre." A plan of the River Ouse navigation—Hull to York—is inset. Railway facilities, water communications, coal, gas, electric, and water supply, and charges therefor, existing industries, eligible sites for factories, tabulated particulars of population and rates—all of these are among the matters briefly set out in the book for the interest of firms who are looking out for a suitable district in which to commence manufacturing operations. A number of photograpic views of buildings and other objects of interest are published.

Electric Cranes.—Messrs. Royce, Ltd., Trafford Park, Manchester, have received orders from Messrs. Galloways, Ltd., Manchester, for two 40-ton 3-motor electric overhead cranes and gantry for their boiler works, Ardwick, and also one 5-ton 3-motor electric overhead crane and steel gantry 700 ft. long for Messrs. Farnworth & Jardine, timber merchants, Seaforth, Liverpool. Both the above are repeat orders.

Pneumatic Tubes.—We are informed that the *Times* has just entered into a contract with the Lamson Pneumatic Tube Co., Ltd., to install a system of 3-in. despatch tubes throughout the *Times* building in Printing House Square and Queen Victoria Street. These tubes are being used by a large number of London and leading Provincial newspapers.

American Westinghouse.—The *Daily Chronicle* correspondent at Pittsburg reports that the Westinghouse Electrical Co. at East Pittsburg has been taken over by a New York syndicate, of which Mr. Pierpont Morgan is said to be the head. The price paid is £8,000,000. It is stated that the plant will be thoroughly overhauled and brought up to date, and set running on full time.

Annual Outing.—On Saturday, 20th inst., the office staff of Messrs. Mosses & Mitchell went for their annual outing by motor-cars to Hartfield, lunching at the Castle Hotel, Tunbridge Wells *en route*. A cricket match played with the local team resulted in a win for the village. Tea was taken at the Dorset Arms, and was followed by a smoking concert. The works department went to Margate for their annual dinner on the same day.

Arc Works Sports.—A correspondent informs us that the annual sports of the Chelmsford Arc Works Club took place on Saturday on the club ground.

Street Lighting.—The Oliver Arc Lamp, Ltd., have just received orders for street lighting at Leyton and Ealing with their "Oriflamme" flame lamps.

Catalogues and Lists.—The Westinghouse Companies' Publishing Department, Westinghouse Building, Norfolk Street, W.C.—We have received an advance copy of a 30 pp. pamphlet, entitled "Heating of Railway Carriages," which is to be issued to-day. It contains an account, with diagrams and other illustrations, of the Westinghouse Brake Co.'s system of steam heating.

Direct-Gas Fuel, Ltd., 17, Victoria Street, London, S.W.—Catalogue describing Gregory's patent smokeless furnaces for boiler and other plants. We understand that some 160 sets have been installed for H.M. Government. Diagrams show the apparatus fitted respectively to Lancashire and Babcock and Wilcox boilers, and to various types of heating furnaces. A list of users, including several electricity supply works, and electrical factories, appears. The latest improvement in the furnace consists of a chamber placed beneath the grate-bars into which air is forced by a steam jet, causing a current of heated air to pass upwardly through the fuel at the front end of the furnace, where the action of the chimney draught is least effective.

Messrs. James Baldwin & Co., Devonshire Brass Works, Keighley.—12-page well-illustrated catalogue of boiler mountings, including the "Betall" renewable stop valves, various safety and other valves, pressure gauges, &c.

Industrial Improvements Co., 2, Jewry Street, London, E.C.—Leaflets giving a description and list of users of the "water-seal" automatic discharge valve or steam trap, which we understand has been ordered by the L.C.C., after test, for the extensions at their East Greenwich generating station.

Messrs. Gent & Co., Ltd., Faraday Works, Leicester.—24-page catalogue containing illustrated information concerning, and prices of, the firm's various "Borough" and "Nugent" water level indicators and alarms. Model estimates, diagrams of connections, and suggestions for fixing, appear.

Messrs. Wm. Geipel & Co., St. Thomas' Street, London, S.E.—Circular describing the Henrion Graphite carbon brushes and giving instructions for their use; prices of Henrion incandescent lamps are also given.

Warner Engineering Co., Ltd., Dartmouth Street, Westminster.—Four-page circular relating to the Warner non-parallel axle truck.

Messrs. Mavor & Coulson, Ltd., 47, Broad Street, Mile End, Glasgow.—We have received copies of Nos. 1, 2 and 3 of the firm's yellow book, entitled "Pick-Quick Coal-cutters at Work." These are annual publications containing all the information given on their monthly data cards concerning the performance of these coal-cutters. We have no doubt that they will be of considerable interest to those engaged in connection with mining installation work.

Messrs. Falk, Stadelmann & Co., Ltd., 83-87, Farringdon Road, London, E.C.—Some leaflets giving particulars of their "Sirius-Efesca" patent metal filament (tungsten) lamps. The standard type is of 25 c.p., but others of 50 and 100 c.p. are also stocked. The lamps are stocked for parallel burning on pressures of from 65 to 130 volts. Illustrations of the standard pear-shape type and of the globular type are shown in the list, and prices are given in tabular form.

Messrs. Simplex Conduits, Ltd., Birmingham and London.—New catalogue of some 80 odd pages, in which is set out a variety of electric lighting, heating and cooking material. The examples of fittings and apparatus shown are, of course, only to be regarded as typical ones, for many other styles and designs are produced, and most of them can be seen at the showrooms of the company in London, Birmingham, Manchester, Liverpool, or Glasgow—and later, as soon as the new premises are ready, at Newcastle. The catalogue is well arranged and well printed, and in the fittings and heating sections some very effective illustrations have been produced. Wires and cables lead the way, followed by a number of electrical accessories, "Ediswan" incandescent lamps, "Simplex" metallic filament lamps and adaptor fittings therefor, convector and luminous radiators of capital and various designs, electric kettles, hot-plates, coffee machines and urns, flat-irons and many artistic specimens of cast and hand-wrought electric light fittings. Electric fans are covered in the last few pages; may the season be such as to create a big home demand for them.

The Sanitas Electrical Co., Ltd., 61, New Cavendish Street, London, W.—This is a catalogue of some 340 pages of fully illustrated descriptions, with lists of prices, of a great variety of electro-medical apparatus. To give anything like a list of the contents here is out of the question, for the index in the catalogue itself occupies four pages. In the first 100 pages are illustrated X-ray and high frequency apparatus, including all the different types of interrupters, a new range of spark coils, focus tubes, appliances for protecting operator and patient from the rays, and a new motor mercury interrupter (the "Sanax"). The next 50 pages deal with various patterns of electric baths, including the Finsen-Reyn lamp and the Quartz mercury vapour lamp. Then come 50 pages devoted to the Schnee 4-cell bath for electrisation of the human body. In the remaining pages, as may be imagined, there is a very various collection of medical electrical apparatus, massage appliances, electrodes, and so forth. We think that the catalogue is one of the completest on the subject that we have ever seen in English.

St. Helens Cable and Rubber Co., Ltd., Warrington.—New 24-page pamphlet giving information relating to their "Dialite" cables for use in mines. A specification of a typical shaft cable is printed, and it is followed with some notes on the choice of cables and methods of fixing, also an illustrated comparison of types of cables for shaft, road and coal-cutter purposes, and methods of fixing same. Earthing of armoured cables is also briefly dealt with.

Electrical Engineers Under Canvas.—During the last fortnight a detachment of the London Division of the Electrical Engineers has been under canvas on the lawn inside Archcliffe Fort. The detachment consists of 44 N.C.O.'s and men under C.S.M. Paris. Some good work has been done in coast defence searchlight work.

Trade Announcements.—Mr. E. J. Evans, A.M.I.E.E., has commenced business in the Britannia Arcade, East London, Cape Colony, as an electrical engineer, and would be glad to receive latest electrical catalogues with trade discounts.

Messrs. Mann, Egerton & Co., Ltd., electrical engineers, have opened new show-rooms and works at 39, Princes Street, Ipswich.

Messrs. C. A. Parsons & Co.'s Leeds office has been removed as from June 13th to 65, Prudential Buildings, Park Row, Leeds.

Messrs. E. Bennis & Co. announce that their works at Little Hulton, Bolton, will be closed for the operatives' annual holiday from June 26th to July 6th.

Dissolutions and Liquidations.—Rand Central Electric Works, Ltd.—A meeting is to be held at 120, Bishopsgate Street Without, E.C., on July 21st, to hear an account of the winding up from the liquidator, Mr. H. Rogers.

Electric Traction Construction and Equipment Co., Ltd.—A meeting is to be held at 5, New Court, Lincoln's Inn, W.C., on July 21st, to hear an account of the winding up from the liquidator, Mr. C. R. Jeeves.

G. H. Hanson & Co., and the British Telephone Supply Co., electrical engineers, 17, Bloomsbury Street, Birmingham.—Messrs. G. H. Hanson, A. E. Martin, and W. C. Carter, have dissolved partnership. Mr. G. H. Hanson and Mr. W. C. Carter will continue the business in partnership.

The Electro-Medical Institute, Ltd.—A meeting of this company is to be held on July 23rd, at 27, Brazennose Street, Manchester, to hear an account of the winding-up from the liquidator, Mr. Thomas Cotton.

Bankruptcy Proceedings.—John Hope Callcott, electrical engineer, Clayton Works, Little East Place, Kennington, S.E.—Under this failure a first meeting of the creditors was held on Monday, at the London Bankruptcy Court, Mr. E. Leadam Hough, Senior Official Receiver, presiding. The debtor furnished a statement of affairs showing liabilities £5,191, of which £1,945 were returned as unsecured, and no available assets. According to the Official Receiver's observations, the debtor states that for many years he was in the employment of the Government of the Strait

Settlements as civil engineer, but retired in 1902 with a pension of £720 a year, which is not legally alienable. In or about January, 1906 he executed a deed of assignment of his property to trustees for the benefit of his creditors generally, and agreed to pay to the trustees £275 per annum out of his pension; he has paid about £478 to them, and the creditors have received a dividend of 2s. in the £, the balances of their respective claims being included in the liabilities scheduled in the statement of affairs in the present proceedings. In December, 1906, he, in partnership with another person, commenced business as civil engineer at No. 97, Queen Victoria Street, E.C., but as no business was done, the partnership was dissolved in June, 1907. In April, 1907, he took a workshop at Dauston Road, Kingsland, N., and in conjunction with another person, who subsequently joined him in partnership, he commenced business as electrical engineer, shortly afterwards removing to Clayton Works, Little East Place, Kennington, S.E. which premises he fitted up at a cost of £325, but in March last his partner removed the whole of the machinery, &c., and he (the debtor) has been unabled to trace his whereabouts. (The Official Receiver has not yet seen the deed of assignment referred to previously.) The debtor attributes his insolvency to the result of an action brought against him by his builder for extras, &c., in connection with the building of certain cottages at Whitminster, near Stonehouse, Gloucester, which action resulted in the builder obtaining judgment for about £492; to losses in connection with the electrical business; and to interest on loans. A scheme of arrangements, providing for the eventual payment to the unsecured creditors of a composition of 10s. in the £, was now accepted by the statutory majority, and will accordingly come before the Court in due course for approval.

E. N. Owen.—The public examination was held last Friday, before Mr. Registrar Brougham, at the London Bankruptcy Court, of Ernest Noel Owen, described as an electrical engineer, lately residing at 2, Yale Court, Hampstead. The debtor was allowed to pass upon accounts showing liabilities £67 6s. 4d. and assets nil.

Francis Benjamin Egginton, electrical engineer and contractor, 11, Tempest Street, Wolverhampton.—A receiving order was made on June 17th on debtor's own petition. The first meeting is to be held on July 2nd, and the public examination on July 22nd, at Wolverhampton.

Book Notices.—"Catalogue of Lewis's Medical and Scientific Circulating Library." New edition revised to end of 1907. London: H. K. Lewis. 1908. Price 5s. net.

"Technical Index." Vol. XII. No. 3. June. London: M. J. Fitz-Patrick. 1908. Price 1s.

"Switchboard Measuring Instruments." By J. C. Connan. London: E. & F. N. Spon, Ltd. 1908. Price 5s. net.

"Electrical Instruments and Testing." By N. H. Schneider. London: E. & F. N. Spon, Ltd. 1908. Price 4s. 6d. net.

"Inventions: How to Protect, Sell and Buy Them." By F. B. Wright. London: E. & F. N. Spon, Ltd. 1908. Price 1s. 6d. net.

"Aldum's Pocket Folding Mathematical Tables for the Use of Engineers, Architects, Students, &c." London: E. & F. N. Spon. 1908. Price 4d. net.

"Journal of the Institution of Electrical Engineers." Vol. 40. No. 189. June. London: E. & F. N. Spon, Ltd. Price 5s.

"The Kelvin Lecture." By Prof. S. P. Thompson. Institution of Electrical Engineers. London: E. & F. N. Spon, Ltd.

We have received a copy of *The Electron*, the first issue of the official monthly organ, conducted by the employés of Siemens Bros. Dynamo Works. A photographic view of the president of the Siemens Institute, Mr. Lee Murray, appears as a frontispiece, and his presidential address, mainly on the subject of "Coal and its Application to the Production of Power Gas," follows later in the magazine. A brief history of the Institute is given, and a sketch of its new home. There is a report of a debate on "Tariff Reform," in which the cause was defeated, and particulars of the other sports in which the Siemens Stafford staff engages from time to time, are included among the contents of this interesting issue.

Meeting of Creditors.—H. W. Sambidge & Sons, brassfounders, Highgate Street, Birmingham.—A private meeting of creditors was recently held at Birmingham, at which a statement of accounts was presented showing liabilities to unsecured creditors of £5,000. The assets, including stock, book debts, plant, patents, catalogues, &c., were £9,967, less debentures, £6,000, leaving a deficiency of £1,033. It was reported that the business was purchased from Mr. Sambidge in 1904, by Messrs. Handley & Shanks, electrical engineers, who carried it on for a period of two years, during which time the trading showed a loss each year. In 1906 they formed the business into a limited company, with a nominal capital of £15,000. £14,000 was considered as fully paid, being £10,000 for goodwill and £4,000 for stock, book debts and plant. At this time Lloyd's Bank were assisting Messrs. Handley & Shanks, and agreed eventually to find the money on debentures, and ultimately they found £5,000 on debentures, and a Mr. Denny another £1,000. The two years' trading showed a loss on the first year of £1,200, and to March, 1908, £1,782. In fact, the business, since it was taken over in 1904 from Mr. Sambidge, showed a total loss of £4,895. Messrs. Handley and Shanks were creditors, and had found money to the extent of £2,000, which was all lost. In addition to this, they became responsible to the bank. It was further stated that it did not appear that there was likely to be much surplus for distribution amongst the ordinary trade creditors. It was stated by the solicitor hat the most that could be said was that Messrs. Handley & Shanks ook to a business of which they had no experience, and the result of he trading was simply a misfortune rather than anything else, and that, in reality, they would be the greatest sufferers. According to the *Birmingham Daily Mail*, the committee appointed had power to make an investigation, confer with the Receiver, and report to the creditors, and also to advise liquidation through the Court if they should be of that opinion.

Ernest Goacher, Gateford Road, Worksop, Nottinghamshire, electrical engineer, &c.—The first meeting of the creditors in this case was held last week at the Official Receiver's Offices, Figtree Lane, Sheffield. It appeared that the debtor started business in 1901 without any capital. At the end of 1907 he opened a shop at Whitwell, and last April another at Creswell, while in February last he disposed of another business which he had carried on for about two years. It was stated that no statement of affairs had been lodged, the debtor having gone away, but it had been estimated that the liabilities amounted to something like £600, while the assets had realised £78, but there were some outstanding book debts. The failure was alleged to be due to interest on borrowed money, bad trade, and illness. It was decided that the matter should remain with the Official Receiver, who therefore acts as trustee.

LIGHTING and POWER NOTES.

Accrington.—A L.G.B. inquiry was held on June 18th into the application of the T.C. for a loan of £7,500 for electricity purposes. There was no opposition.

Acton.—The Electricity Committee reported at the last meeting of the District Council that the undertaking showed a gross profit for the year ended March, 1908, of £1,082, but after providing for loans, instalments, interest, &c., there was a net deficiency of £2,935.

Bexhill.—With regard to the recent application for a loan of £3,860, the L.G.B. has sanctioned £1,107 to defray expenditure on mains already laid; £1,653, prospective expenditure on mains and services; £240, prospective expenditure on meters; but respecting the loan of £860 for mechanical stoker and induced draught plant, the Board defers consideration until it is informed of the Council's decision regarding the installation of a second stoker. The Council has since resolved to purchase a second stoker.

Brighton.—According to the *Sussex Daily News*, the annual statement of accounts for the past year shows that, after payment of interest and providing for the sinking fund, the accounts show an adverse balance of £3,657. The total loss on three years has been £14,867. The preceding three years showed a total surplus of £20,324. The reserve fund is reduced to £7,412. It will be remembered that heavy capital expenditure has been incurred on new power plant which is not as yet fully productive.

Continental Notes.—France.—Additional plant is about to be put down at the municipal central electric lighting station at Pontarlier (Doubs.).

Coventry.—Application has been made by the Corporation to the L.G.B. for sanction to borrow £35,000 for the purposes of its electricity undertaking, including the laying of mains in the parishes of Foleshill and St. Michael Without. Mr. F. H. Tulloch, M.Inst.C.E., has been appointed to hold an inquiry into this application shortly.

Dundee.—The accounts of the electricity department for the year ending April 30th, 1908, have just been issued, and show a very satisfactory state of affairs. The number of units generated is 4,719,085, an increase of 708,000 over last year, while the revenue is £34,973, an increase of £3,870. A very large item in this year's accounts is the increase in the coal account, which is fully £3,000 over last year. The gross profit amounted to £15,259, out of which has to be paid interest and sinking fund amounting to £9,578, while the Committee again adopted Mr. Richardson's recommendation to reduce the capital debt of the undertaking by transferring £5,380 from the capital account to revenue, the balance, with the balance from last year, leaving a net profit of £1,078. During the last four years the sum of almost £24,000 has been paid out of revenue account, a large part of which has gone to reduce the capital debt, while the balance has been for the large alterations at the power station. The Committee has adopted Mr. Richardson's suggestions with regard to the price to be charged to power users, which in future will be on the sliding scale, with a maximum of 2½d. per unit, while large consumers with a large load-factor can have power as low as ·45d. per unit. The price of energy for the tramways has also been reduced from 1¼d. to 1½d. per unit. A new feature of the charges for next year is the charge for electric signs, which should tend to make this form of advertisement very popular. For the first 200 units the rate is 3½d. per unit; all above this amount, 1½d. The work of erecting the new generating station is being pushed on with all speed, most of the contracts having now been placed, and it is hoped that everything will be completed, and the station in time for next winter's load.

Dunfermline.—The T.C. last week decided to enter into an agreement with the Fife Electric Power Co. on the terms suggested by Sir Alex. Kennedy, and submitted in February last.

Edinburgh.—The T.C. has decided to make the period for repayment of the capital invested in the electricity undertaking 25 years instead of 30. This involves an addition of about £6,500 to the annual sinking fund payment.

Enniskillen.—At the monthly meeting of the Lough Erne Drainage Board, it was reported that Mr. W. A. Lindsay, of Belfast, had written to the secretary asking if the Board would be disposed to encourage the development of electrical energy at Belleek by the use of the Falls. Mr. Irwin said he would reply, stating that the Board was anxious to encourage this as much as possible, but that it would like to have some definite proposal as regards terms first. The secretary mentioned that other electrical companies had approached him on the same subject, and he thought it would be better to take no definite action until they would see from whom they would get the best terms. It was decided to write to Mr. Lindsay stating that the Board was in sympathy with the project for establishing an electric power station at Belleek, but that it could take no action in the matter until more definite particulars and proposals were submitted.

Exeter.—The past year has been a record one for electric lighting. The gross profits are shown to have amounted to £9,524, and out of this sum the interest on borrowed capital absorbs £3,108, the sinking fund a further sum of £3,812, leaving a net revenue balance of £2,604, the largest surplus obtained in any year since the Council acquired the undertaking ten or a dozen years ago. There has been spent a sum of £637 on cables, &c., for connecting street lamps to mains, and it was proposed to extend the repayment of this sum, which is in the nature of capital expenditure, over three years; but with this £2,604 credit the Committee advises that this liability be forthwith discharged, and this will reduce the surplus to £1,967. In view of the fact that the Committee has reduced the price of lighting energy 10 per cent., with a proportionate reduction to users of energy for motor purposes, the Committee proposes to carry this credit balance to reserve. The electric light installations, however, have considerably increased since the reduction in the price of energy, and some of the loss due to more economical lamps will be recouped by greater output.

Farnworth.—The U.D.C has applied to the L.G.B. for sanction to borrow £7,000 for purposes of electric lighting. An inquiry into the application is to be held on July 7th by Mr. H. Shelford Bidwell.

Handsworth.—A L.G.B. inquiry was held on June 18th into the application of the U.D.C. for a loan of £22,300 for electricity purposes, £1,000 being for the hire and hire-purchase of wiring in private houses. There was no opposition.

Hastings.—By 17 votes to 13 the T.C. has decided to supply energy for the lighting of all public lamps in streets where mains are laid, and in other thoroughfares where mains may hereafter be laid. The initial cost of the conversion of gas lamps will be about £1,700.

Hornsey.—Submitting the financial statement for the half-year ended March 31st, at the last meeting of the B.C., Councillor Berrenger, chairman of the Finance Committee, said that a year ago the electricity undertaking had to be subsidised to the extent of £1,421 to meet a deficit on the previous two years' working, but the outcome of the Electricity Supply Committee's trading during the six months ended March 31st had been in every way encouraging. The balance carried to net revenue account as the result of the half-year's working was £6,253, being a net increase over the corresponding period of the previous year of £853, the income having increased by £1,366, and the expenditure by £513. The debit balance totalled £6,204, which, deducted from the amount transferred from revenue account, left a surplus of £49.

India.—According to *Indian Engineering*, the local executive engineer is collecting data with the object of ascertaining whether or no it would be possible, at reasonable cost, to utilise the falls of Ani-Sakan or other watercourse in the neighbourhood of Maymyo, for the development of electric power for the electric lighting of the Pasteur and Vaccine Institutes, barracks, and other Government buildings at Maymyo.

Leeds.—With a view to providing electricity to consumers for special illuminations in connection with the Royal visit, the Tramways and Electricity Committee has decided that the charge shall be 7s. 6d., with an increase for exceptionally large displays. The sum fixed will entitle the consumer to the use of current within reasonable hours for a period not exceeding one week. The installations are to be subject to the approval of the electric lighting department.

Liverpool.—Through the melting of a fuse at the Lister Drive generating station, there was a temporary failure of the electric supply for lighting purposes throughout the city on Friday night, and in one area nearly a quarter of an hour elapsed before the supply was resumed.

London.—At the sitting of the Metropolitan Asylums Board on Saturday the Hospitals Committee reported having had under consideration the question of the principle of Lighting the North-Eastern Hospital by electricity, together with a letter from the engineer of the North Metropolitan Electric Power Supply Co., furnishing particulars of that company's charge for the supply of the electricity required. The engineer-in-chief (Mr. Hatch), whom it had consulted in this matter, had furnished figures comparing the actual cost of gas lighting at this hospital for the last two years with the probable cost of lighting by electricity, and he estimated that the total cost of electric light and gas (a small quantity of which would still be required for cooking, heating, and emergency burners), would amount to £700 per annum, compared with the present annual expenditure of £1,200 per annum, showing a saving of £500 per annum in favour of electric light The managers were aware that electric light had the advantage over gas in that the light can be more favourably arranged, which is especially important in the case of the wards; it is also more convenient, more hygienic, is attended with less risk from fire and is generally accepted as the most suitable light for institution purposes.

The Committee approved of the terms (less than 2d. per unit) on which the North Metropolitan Electric Power Supply Co., Ltd., was prepared to supply electricity, and was also of opinion that electricity should be installed in the whole of the hospital, and not in the permanent buildings only. The estimated cost of the installation was £4,500. The recommendation was agreed to.

BATTERSEA.—At the meeting of the L.C.C. on Tuesday, the Finance Committee reported that the Battersea accounts for 1906-7 showed a deficiency, after providing for interest and repayment of loans, of £17,167, and the borough council expected a further large deficiency in the current year, so that considerable contributions from the rates were necessary. This was, in the opinion of the committee, very unsatisfactory, but the loans were being repaid on the instalment system, which involved a heavier loan charge than the annuity method during the early years of the loans.

The Electricity Committee of the B.C. has approved a scheme for public and private lighting on Battersea Rise House Estate, which provides for laying distributing mains in various thoroughfares and a feeder from Northcote Road to the estate, and for erecting ten additional arc lamps along Clapham Common West Side, and 37 lamp columns fitted with brackets similar to those on Heathfield estate, but with Osram metallic filament lamps of 100 C.P. each for the side streets. The estimated cost will be £5,362. Negotiations are in progress with the various builders who contemplate erecting houses on the estate, and one of them has already undertaken to wire 60 houses for the electric light.

STEPNEY. — The B.C. is circularising the other B.C.'s, and also the local authorities of Greater London, asking that representatives be appointed to a deputation which it is proposed shall wait upon the President of the B. of T. with a view to the re-introduction of the Supply of Electricity Bill as brought forward in the session of 1906.

ST. PANCRAS.—The B.C. had a late sitting on Wednesday, the 17th inst., the main subject for discussion being the proposed confirmation of the provisional decision of the Electricity Committee to wire houses in the borough through the medium of private contractors at accepted schedules of prices. Councillor Shearing, in opposing the recommendation, said that if the proposal were adopted, traders in the borough engaged in electrical work would suffer great injustice. The effect would be that contractors would be invited to schedule their prices, and the contractor offering the best discount would be accepted; presuming that the discount was 15 per cent. that would form a basis to govern practically the whole of the electrical work in the borough. Councillor James, as an electrical contractor, favoured the proposal, and hoped that before many years had passed St. Pancras Council would have the complete control of the borough electrical undertaking. The electricity department should give the same facilities to householders as the Gas Light and Coke Co., who fitted up every requirement on the hire-purchase system. Councillor Ingram, Chairman of the Electricity Committee, said that the undertaking was threatened with outside rivalry from electrical companies which wished to enter the district. The companies argued that they could produce electricity cheaper than the Council. This, on behalf of the Council, was denied, but when once these outside companies "got their foot in," it would mean ruin to the St. Pancras undertaking. Unless more consumers were obtained the supply could not be produced more economically by the Council. There were many thousands of houses in the borough where electric light might be used. It was cheap and would be cheaper, but the one thing that stood in the way of the small consumer was the cost of wiring and fittings. The principle recommended had been adopted by the boroughs of Hackney, West Ham, Ealing, and at Wolverhampton, Norwich and Brighton. By 36 votes to 14 it was decided to refer back the matter for further consideration and report.

Margam.—With reference to the decision of the B. of T. to revoke the E.L. Order, the U.D.C. has decided to request the Board to alter its decision and to extend the order.

Newcastle-under-Lyme.—Major J. Stewart, R.E., conducted an inquiry on behalf of the L.G.B., on Friday last, in reference to the application by the T.C. for sanction to borrow £700 for the extension of the electricity undertaking. It was stated that of the £700, cables were estimated to cost £579, services £100, and contingencies £20 10s. When informed that the contract of Messrs. Bagguley & Wood at £579 10s. had been accepted, the inspector pointed out that this was not the lowest tender. The electrical engineer said they accepted the tender of Messrs. Bagguley & Wood because the Council thought it would get certain advantages from a local firm, and also because the lowest tender was that of a firm who were not members of the Cable Makers' Association. This reply apparently did not satisfy the inspector, who asked that the Town Clerk might send to the Board the "real reason."

New Malden.—The Parliamentary Committee of the U.D.C. reported upon an interview with the London Electric Supply Co. on the system proposed to be adopted by it as under, taker for the supply of energy under the Electric Lighting Order 1907. A supply will be given at an extra high pressure of 10,000 volts to distributing stations, from which a high-pressure alternating-current supply at constant pressure will be given to transforming stations. From the transformers a low or medium pressure supply will be given to consumers

Plymouth.—The establishment of an Electric Light Corps for Plymouth, Devonport, and Stonehouse in connection with the Territorial Army scheme is to be immediately commenced. Members of the corps will have to work the various searchlights in the surrounding forts. Without the powerful and effective display made by these numerous lights, the work of the gunners would be almost useless. It is proposed that the men of the Electric Light Corps shall receive their training at the forts around Plymouth, and their annual camp training will also take place at the forts. A complete company will consist of 230 non-commissioned officers and men. It is believed that there are in the three towns a large number of young men trained in electrical and engineering work who could, with the sacrifice of a small portion of their leisure time, make the corps a success.

Rishton.—It was suggested at a Council meeting last week that a public refuse destructor would be in the interests of the residents, and would furnish a certain amount of electrical energy for the district.

St. Annes-on-the-Sea.—The District Council is borrowing £3,500 for electric lighting purposes, a L.G.B. inquiry into the application having been held at the beginning of this week.

South Wales.—The great collieries of South Wales are rapidly substituting electricity for steam and compressed air for transmitting power. Already the whole of the surface plant, including tipping, screening, coal-washing and pumping is driven by electricity at the Messrs. Locket's Merthyr collieries at Mandy, while an extensive electrical installation is nearing completion at the Ferndale pits of Messrs. D. Davis & Sons, Ltd. In connection with the scheme for the utilisation of electricity for the operation of the surface and underground haulages at the Mandy pits, the whole of the plant at No. 3 will be operated electrically, and the extensions now in progress will include the conversion of an Uskside steam haulage engine of 200 H.P., and three new electrical hauling engines of 100, 200 and 500 H.P. respectively. The motors will be of the protected type with enclosed slip-rings, and will be capable of an overload of 100 per cent., when running at a speed of 360 R.P.M., on 2,200 volts, 25 cycles, 3-phase circuit. All motors of 100 H.P. and under, will run at 440 volts, 25 cycles, 3 phase. The whole of the motors and switchboards have been made by the British Westinghouse Electric Co., and, when the complete plant is in operation, upwards of 1,500 H.P. will be installed, the energy being obtained from the Treforest Electrical Consumers' Co.

Southend-on-Sea.—The T.C. has received from the L.G.B. sanction to a loan of £18,344 for electricity purposes. A sum of £140 for spare armatures has been disallowed, as the Board does not think that spare parts are a proper subject for a loan.

Watford.—The balance of income over expenditure in connection with the electricity undertaking for the year ended March was £915, and it is proposed that this amount should be transferred to the relief of the general rate fund.

Wigan.—The T.C. has applied to the L.G.B. for a loan of £2,000 for cables.

TRAMWAY and RAILWAY NOTES.

Aston Manor.—At the inaugural meeting of the Ratepayers' Association a resolution was moved severely condemning the action of the T.C. in its arrangement with the B.E.T. Co., and expressing the opinion that allowing the B.E.T. to deduct £10,000 from the surplus profits was a gross waste of public money, and that it had created a lack of public confidence. The resolution also requested the Mayor to call a town's meeting to discuss the whole case at the earliest possible date.

Belfast.—A mass meeting of the citizens was held in the Ulster Hall on the evening of the 16th inst. for the purpose of considering what has been described as the "present position of the Belfast tramways." The meeting may be looked upon as a political and trades unionist move for the purpose of bringing the Corporation into disrepute. Vigorous addresses were delivered, and a resolution which declared that the meeting viewed with alarm the unsatisfactory state of the tramway undertaking, and calling on the Corporation to have an accountant appointed to report on the financial standing of the undertaking, was passed.

Brighton.—In the course of his report on the working of the tramways, the manager points out that the permanent way continues to be a heavy drain on the financial resources of the undertaking. In the early part of the year the rail joints in Gloucester Place and Marlborough Place were welded by the "Thermit" process as an experiment. The result has been that the cars make considerably less noise than formerly, but owing to the rails being in unbroken lengths, the earth tremors of a passing car are transmitted over a longer length of track than was the case before, causing the wood paving blocks to rise more than they did. This disadvantage will be provided against in all future work by anchoring the rails down every 7 or 8 ft. The cost of welding the joints with all the necessary work which it involves is so high that it cannot be carried out on an extensive scale on the old track. The track in other parts of the town is beginning to show signs of wear, and before long it will be necessary to renew a good deal of the wood paving. He further states that in his opinion the tramways department is paying £1,638 per annum more for its energy than it ought to pay.

By 36 votes to 10 the T.C. has decided against the proposed east to west tramways scheme submitted by a syndicate.

Continental Note.—HUNGARY.—Good progress is being made with the work of converting the horse tramways in the town of Szegedin to electric traction, and it is expected that several lines will be ready to be put in operation in August next.

Eccles.—The T.C. is up in arms owing to the action of the Lancashire United Tramways Co. in running its cars on the lines of the Corporation between Parrin Lane, Winton, and the boundary of the borough at Alderforest, near Worsley, without first obtaining the Council's consent. It has been decided to seek an injunction to prevent the company running its cars on the length of lines stated, which belong to the Eccles Corporation. Salford had the lease of the lines in Eccles, and the section here concerned forms the direct route between Manchester and Liverpool.

Glasgow.—The report of Lieut.-Col. Yorke on the accident on January 3rd to a car which got out of control and collided with eight lorries in succession, two persons being killed, was issued on the 19th inst. The inspector points out that the death of the motorman, Dolan, makes it impossible to ascertain exactly what happened. It is possible, adds the inspector, that when Dolan came to apply his magnetic track brake, it did not operate, not on account of any defect in it, but simply because the electrical connections were wrongly made. By the time he realised that, for some reason which he did not understand, the magnetic track brake was out of use, the speed would have got beyond the power of the hand brake. The inspector goes on to say that Inspector Muirhead committed a grave error of judgment in allowing the car to start with the reversing handle in the forward position at the rear end, and with no reversing handle at the driving end, adding that, "Muirhead had no right to cause, or permit, Dolan to run any risks. A heavy double-decked tramcar is at all times an awkward thing to manage on an incline, and not a single precaution can be safely dispensed with." In conclusion, the inspector says: "I am disposed to think that it is a mistake in tramway practice to regard any brake as an 'emergency' brake, and as one which is only to be used on rare occasions. When this custom is followed, there is a risk that the brake will either be wrongly applied, or, for some reason or other, will fail when the occasion for its use arises. In tramcar driving, the 'emergency' is ever present, and the motormen should be instructed to use at all times the most powerful braking device at their disposal."

The official inspection of the new tramway line near Glasgow was fixed for to-day. Over three different systems, there will now be a stretch of 40 miles—from Wishaw, the well-known coal and iron district of Lanarkshire, to the far-famed Loch Lomond, in Dumbartonshire. Something in the nature of a deadlock has been caused by the action of the Corporation of Clydebank in refusing to bear a share of the alteration of the bridge for tramway passage purposes over the Forth and Clyde Canal at Dalmuir. It is near this point that the Glasgow T.C. and the Dumbarton county tramway systems meet. Neither the Glasgow authorities nor the Dumbartonshire Co. will consent to pay a half-share each of cost, contending that the Clydebank Corporation should bear a full share. It is now reported by the Dumbarton Co. that the Clydebank T.C. had not seen its way to permit of the physical junction of the two systems being made. This decision has come before the Glasgow T.C. Committee, who, being of opinion that the junction would be to the mutual advantage of all parties interested, agreed to express regret that the company had not been able to come to an arrangement with Clydebank T.C.

The Tramways Committee has issued the annual balance-sheet on the tramways undertaking. The abstract shows:—Gross revenue, £916,566. Expenditure—traffic, £256,605; general, £91,323; repairs, £122,750; power, £39,317; set aside for renewal and depreciation, £188,603; lease of Govan lines, £5,077; rent of Paisley District Tramways, £4,784; interest, £33,152; sinking fund, £68,804; income-tax, £9,436; Parliamentary expenses, £2,885; common good, £35,000. This leaves a net balance of £38,830, which has been appropriated:—Special depreciation, £4,061; general reserve fund, £34,769. Though the income last year was only £895,842, the net balance after meeting expenditure was £70,279.

The T.C. has been approached by the Glasgow Territorial Forces Association for special terms at reduced fares to men of the Association travelling to and from the rifle ranges.

Greenock.—It was stated, at a meeting of the T.C., by Provost Denholm, that the income of the tramway company was down £2,200 this year already. A report was also made that the amount of energy used by the company continued to decrease, and that the service of the cars specified in the lease was not given. Dull trade was given as a possible explanation.

Halifax.—Nearly all the claims for compensation arising out of the disaster on the Corporation tramway route at Sowerby Bridge in October last, have been amicably settled. The total amount of the claims is likely to exceed £10,000.

Haslingden.—The Corporations of Haslingden and Accrington have adjusted their differences with regard to the tramways. For nine months Accrington will supply Haslingden with

cars and energy over the two miles length from the boundary of the boroughs to the "Commercial" at Haslingden, the centre of the town. The cost to Haslingden will be 7d. per car-mile. As the cars will run through from Haslingden to Accrington and *vice versa*, the arrangement will re-establish traffic, which has been lost during the time the two boroughs have been relying upon two different systems.

Hythe.—In reply to Councillor Strahan as to the commencement of the tramway work, the town clerk read the letter which previously had been submitted to the Council from Mr. Cownie as to the difficulty in getting a tramway scheme financed at present. He added that under the Act the tramways had to be commenced and completed within a certain period, which would expire from about 12 months next August; he added that he would not be surprised if there was an application to Parliament in the next session for an extension of time.

London.—As a Hampstead Tube train was running into Euston station on the 17th inst., the back axle of the first coach suddenly snapped, throwing the carriage off the metals and bringing the train to a standstill. Fortunately, beyond a slight shaking, none of the passengers was injured. Traffic was completely disorganised for some hours.

TOTTENHAM.—The Metropolitan Electric Tramways, Ltd., has asked the U.D.C. to carry out the widening of the High Road, opposite High Cross, in the same way as the road improvements in Seven Sisters Road and the High Road near Bruce Grove. The company is to be informed that the works will be put in hand as soon as the necessary deposit, viz, £620, is placed with the Council. The Metropolitan Electric Tramways, Ltd., has further received permission to fix an automatic point controller at the junction of High Road and Bruce Grove.

FULHAM.—The ratepayers are protesting against the decision of the L.C.C. to install the overhead trolley system in the area and over Putney Bridge, while at the same time retaining a payment of £30,000 made apparently on account of street widenings at the time when it was proposed to install the conduit system. The ratepayers claim either the return of the money or the installation of the conduit system as originally arranged.

L.C.C.—The Finance Committee has presented a series of reports dealing with the report of Messrs. Pixley & Peat, presented last March on the tramway accounts. Dealing first with the question of obsolete capital, the Committee says that in its opinion the Council should accept the advice of the accountants in regard to wiping off obsolete capital. The statutory sinking fund automatically provides for the writing off, not only of any obsolete capital, but of the whole of the capital within a term of years. The accountants think, however, that the present sinking fund arrangements are inadequate in the case of obsolete capital. The Committee thinks that as the conversion of the horse traction lines will be complete in April, 1913, the new system of rapidly paying off the debt should begin in 1914. The comptroller estimates the amount of obsolete debt in that year at £961,954. Dealing with this proposal, the Committee says it has come to the conclusion "that it would be reasonable to provide for writing it off by equal annual instalments in a period of fifteen years from March 31st, 1914. Up to this date the present loan repayments would continue. The effect of the proposal on the annual debt charges will be as follows:—The present charge (1908-9) in respect of the whole of the horse traction debt incurred up to March 31st, 1907, is £118,734. In 1913-4 this will have decreased to £102,611, and in 1914-5 the charge under present conditions will be £88,293. The additional charge in that year in respect of obsolete capital under our proposal will be £34,584, making the total for the year £122,877, which will be an increase of £20,266 on the previous year, and an increase of £4,143 over the charge for the present year. If the proposal is adopted the whole of the debt in respect of obsolete capital will have been paid off by March 31st, 1929. The re-arrangement of the loan periods will require the sanction of His Majesty's Treasury, who have approved of the periods at present in operation. On the subject of the renewals reserve fund the Committee says that it is entirely in favour of the establishment of an adequate renewals fund. The question of the relation between a renewals and depreciation fund and the repayment of capital by a local authority is one upon which difference of opinon prevails even amongst expert accountants. The amount of the present renewals reserve fund at March 31st, 1907, was £141,855. The accountants point out that of this amount £105,000 had been set aside out of the revenue from the electric system, whereas on the basis of 1d. per car-mile £182,636 should have been set aside. The Committee, after inquiry, recommends that ¾d. per car-mile on the total mileage run each year is an adequate provision for renewals. On this basis, £200,733 only will be required by the end of 1907-8, and some £218,389—less £34,634 withdrawn for a general reserve fund—will actually have been provided according to present intentions. In concluding its report the Committee says that "during the next 21 years the burden upon the revenue of the undertaking for debt charges will be reduced by annual sums amounting in the aggregate to £1,801,084, of which £1,459,260 is due to decreased charge for interest, and £341,824 to reductions in the annual charges for repayment owing to the entire discharge of certain loans. This means that with the same revenue as in 1907-8, which may be said to be earned on capital expenditure incurred to March 31st, 1907, the undertaking will be able to bear increased expenditure on repairs or any other item to the extent of no less than £1,801,084 during the next 21 years. If the proposal to discharge the obsolete capital in 15 years from March 31st, 1914, is adopted, the margin of reserve thus indicated is reduced to £1,363,321."

The G.B. surface-contact system in Whitechapel, which has been subjected to unfair criticism at the hands of some members of the L.C.C., was again the subject of questions at Tuesday's meeting of the Council. In the course of his reply, Mr. W. W. Thompson, Chairman of the Highways Committee, stated that the Board of Trade inspection took place on Monday, and he had just received a certificate for a period of six months. He added that that term was the same as that permitted for the conduit system, and he anticipated that a renewal of the certificate would be obtained without difficulty. Arrangements were being made for the construction of tripods, marked "danger," to be carried by each of the cars, and the chairman expressed the hope that a small number of cars would be in service as soon as possible.

The L.C.C. decided on Tuesday to make application to Parliament in the session of 1909 for authority (1) to enable the Council to deal with obstructions caused by the breakdown of vehicles on the tramway tracks; and (2) to establish stopping-places for the cars in such positions as may be thought desirable, such powers having already been obtained by a number of local authorities and companies.

The Whitsuntide traffics on the Metropolitan Electric Tramways, Ltd., include some striking figures. On Whit-Monday the number of passengers carried was £334,806, and the receipts amounted to £2,389, being at the exceptionally high rate of over £12 per car, or 25·99d. per car-mile. For the week ending Friday, June 12th—that is to say, the week including the Whitsuntide traffics—the passengers numbered 1,391,531, and the receipts amounted to £8,177. For the corresponding week last year, when there were no holidays, the number of passengers amounted to 1,005,073 and the receipts to £5,134. This year the route mileage in operation was 42, and last year it was 33. The aggregate receipts for this year up to the date mentioned are £123,161, as compared with £98,371 last year.

Prestwich.—The Tramways Committee of the District Council has been in communication with the Salford Corporation with a view to obtaining a share of the profits from the tramways to run through its township. The Corporation, it is understood, has given permission for a check to be taken of the passengers on the Bury New Road and Bury Old Road routes during the first 14 days in July, on condition that such check does not interfere with the traffic or the passengers.

Rawtenstall.—At the monthly meeting of the T.C. on the 18th inst., it was decided to agree to the construction of the tramway from the present terminus at Crawshawbooth northwards to the boundary of the borough, and that the selection of a firm to do the work be left to the Electricity Committee. It was decided that the consideration of the tenders for overhead equipment be deferred to the next meeting of the Committee, and also that the specification for tramcars, prepared by the electrical engineer, be deferred to next meeting, and that in the meantime the clerk obtain information from other towns. The town clerk reported that the B. of T. had consented to the use of steam power on the Rawtenstall to Haslingden tramways for a further three months.

South Lancashire.—A correspondent states that, from a reliable, but unofficial, source, he gathers that both the L. and N.W. and the L. and Y. Railway Companies are seriously contemplating electrifying certain portions of their lines in the Manchester and Liverpool districts respectively. Official confirmation of such pending developments is usually withheld until the last moment.

TELEGRAPH and TELEPHONE NOTES.

Cables and Trawlers.—In answer to a question in the House of Commons as to whether the cable steamer *Buccaneer* had reported that, on the 9th inst., she hailed four steam trawlers trawling off the south-west coast of Ireland, in an area in which at least five cables were laid; and whether he could make any statement as to measures which the Government were taking to safeguard British interests in that connection, the President of the Board of Trade replied that there were, legal and other difficulties in the way of action under the Submarine Telegraph Act, and as several departments were interested in this matter, he was considering with his colleagues the question of appointing a small inter-departmental committee to examine it, with instructions to report as soon as possible.

Much interest in the matter has been manifested in the United States, where a strong agitation is on foot with a view to inducing the government to take action.

Jamaica.—A report on the telegraph and telephone lines of Jamaica states that at the end of the year 1906-7 there were 64 telegraph stations and seven telephone stations in operation under the postal system. In addition to these, the railway telegraph service had generally been available to the public. The total number of messages sent was 109,859, being 7,870 more than in the preceding year. All the telegraph offices had been overhauled. The cost of the telegraph system was approximately £7,885. As the receipts amounted to £6,614, and in the preceding years to £5,983 and £4,792 respectively, the cost was considerably in excess of the telegraph receipts. The public works department spent £7,444 on the ordinary maintenance of the buildings and telegraph, and £8,012 on earthquake repairs.

Melbourne.—The undergrounding of the telephone and telegraph wires in the city of Melbourne has been entered upon, a contract at £48,000 having been let for driving the required tunnels through a portion of the area. These tunnels will run about 25 ft. below the surface of the streets, in order to be clear of the electric light cables and the gas, water, and sewerage pipes. They will be 6 ft. 6 in. high by 4 ft. 6 in. broad. As funds become available, the remainder of the city wires will be similarly treated.—*Australasian Hardware and Machinery.*

Paris Telephones.—In Paris the agitation caused by the inefficiency of the telephone service continues to find expression in the Press and in public meetings of protest. The new central-battery exchange in the Passy district of Paris has increased the volume of public complaint against the telephone service, as, owing to the mistaken policy of the French Administration in maintaining in service the old instruments at the subscribers' stations, which are of a variety of types, and are not adapted to central-battery working, the service of the new exchange is even worse than that of the old. The interest of Parliament having been aroused by the intensity and persistence of the public complaints against the telephone service, a Parliamantary Committee of members of the Chamber of Deputies for the various divisions of Paris last week invited the Council of the Association of Telephone Subscribers to attend the Committee, with a view to giving detailed information regarding the existing difficulties with the telephone service. At this meeting the Association was represented by the Marquis de Montebello, president; Mr. Archdeacon, vice-president; and Mr. H. Laws Webb, consulting engineer to the Association. The Parliamentary Committee, presided over by M. Georges Berry, consisted of some fifteen members representing various divisions of Paris, who gave a sympathetic hearing to the case for the telephone-using public. Mr. de Montebello explained that the principal difficulties arose from the fact that the telephone service was operated merely as a branch of the Postal and Telegraph Administration, and he urged that for efficient working it was necessary to organise the telephone service as a separate department in all respects. Mr. Archdeacon followed along the same lines and gave examples of the disorganisation at present existing among the staff of the telephone branch of the French Post Office; he quoted figures showing the greatly higher development of the telephone in the other principal European countries, and the more favourable tariffs for telephone service which were offered to the public of other countries. Mr. Laws Webb explained to the Committee the essential difference between the telephone service and the postal and telegraph services, and pointed out that for an efficient city telephone service uniformity of plant and special training of the staff were essential requisites. He confirmed the arguments of Messrs. de Montebello and Archdeacon to the effect that no serious progress could be made with the telephone service in France until the service was placed in charge of a separate telephone department, with a special staff and organisation, devoted exclusively to telephone work. Members of the Committee themselves complained that they were unable to obtain any precise data of the results of the telephone branch of the French Post Office: the Administration itself did not know what it was doing, so far as finance was concerned. The Committee unanimously promised to support the Association of Telephone Subscribers, and to take the matter up actively in Parliament, with the object of securing the appointment of a special commission of members of the Chamber and representatives of the telephone subscribers, for the purpose of making a thorough investigation of the difficulties under which the French telephone service now labours.

Telegraphic Interruptions and Repairs:—

Cables.	Interrupted.	Repaired.
Curacao-Coro, Curacao-La Guayra, Curacao-Maracaibo } Closed	Jan. 12, 1906	
Tarifa-Tangier	Jan. 18, 1904	
Port Arthur-Chifu (Closed)	Mar. 9, 1904	
Las Palmas—Arrecife	May 18, 1908	
Cayenne-Salinas	May 9, 1908	
Pera-Dardanelles	May 20, 1908	
Sierra Leone-Accra	May 28, 1908	
Cadiz-Tangier	June 3, 1908	

Wireless Telegraphy.—On her homeward voyage recently, the liner *Caronia* was in wireless communication when 2,642 miles from Liverpool, making a new record.

It is officially announced, according to Reuter, that from July 1st the German telegraph service will undertake wireless telegraphy. The rates will comprise coastal, ship and ordinary tariffs.

CONTRACTS OPEN and CLOSED.

OPEN.

Australia.—Perth.—September 7th. 650 telephone wall sets, 150 table sets, various switchboards, other instruments, protectors, &c., for the Postmaster-General's department. Some particulars can be seen at the Electrical Review office.

Perth.—September 7th. The Postmaster-General requires tenders for one common-battery switchboard, of nine sections in all, together with all associated frames, racks, power plants and parts for Fremantle Exchange.

Sydney.—The Postmaster-General requires tenders for 69 tons wire (hard-drawn copper, 200 lb. per mile), Specification No. 3; 1 ton copper binding tape (200 lb. per mile), Specification, New South Wales, No. 37; and 15,000 large best white insulators, Specification, New South Wales, No. 17; similar pattern, No. 5.

Dublin.—July 13th. Sub-station switchboards, transformers and accessories, for the Corporation. See "Official Notices" to-day.

July 13th. Boiler plant for the Pigeon House generating station for the Corporation. See "Official Notices" to-day.

June 29th. Machinery oils for the Corporation electricity works for one year. See "Official Notices" June 19th.

Edinburgh.—July 3rd. Electric lighting and power installation for the new Engineering Laboratory, Heriot Watt College. Specification from Mr. J. Anderson, Superintendent of Works.

Fulham.—July 2nd. Vertical high-speed engine and 20-kw. steam dynamo (both British-made), for the Guardians. See "Official Notices" June 12th.

Galicia.—August 31st. The municipal authorities of Stanislau are inviting tenders for the establishment of a central electric lighting station in the town.

Germany.—July 7th. The Leipzig Municipal Electricity Works require tenders for an electrically-driven crane of 34,000 kg. capacity. Particulars may be obtained on sending 2s. cash to the Verwaltung des Städtischen Electrizitätswerkes.

July 10th. The municipal authorities of Leipzig are inviting tenders for the supply of 18 Cornish-type boilers, with superheaters, for the central electric lighting station.

Gravesend.—June 27th. Yellow-flame arc lamps, columns, &c., for the electricity department. See "Official Notices" June 12th.

Islington.—July 16th. Cooling tower for the Lighting Committee. See "Official Notices" to-day.

London.—L.C.C.—July 7th. High-tension main switchgear and low-tension auxiliary switchgear, for the East Greenwich generating station of the L.C.C. See "Official Notices" June 19th.

Malvern.—June 29th. 50-kw. steam alternator, exciter, &c., for the U.D.C. electricity works extensions. See "Official Notices" June 5th.

Pontypridd.—June 30th. Six double-deck tramcars, for the U.D.C. See "Official Notices" June 19th.

Russia.—September 14th. The Town Clerk of Odessa (Upiawa) will receive tenders for a concession to erect and work a power and lighting supply. A central station of a minimum of 6,000 h.p. is to be erected and equipped.

Salford.—July 1st. Re-wiring the Royal Technical Institute. See "Official Notices" June 19th.

St. Pancras.—July 13th. Low-tension switchboard additions at King's Road generating station, for the B.C. See "Official Notices" to-day.

Spain.—July 15th. The municipal authorities of Viana del Bollo, province of Oreuse, are inviting tenders for the concession for the public electric lighting of the town. Tenders are to be sent to El Secretario del Ayuntamiento de Viana del Bollo (Oreuse), whence particulars may be obtained.

Bilbao.—The municipality requires tenders for the supply, delivery and erection of eight elevators at the new grain market, at an approximate cost of £3,000. Particulars may be obtained from the Ayuntamiento Constitutional.

Stepney.—June 29th. Meters, demand indicators, time switches, and arc lamp carbons, for the electricity department. See "Official Notices" June 12th.

CLOSED.

Dover.—Messrs. John Wright & Sons, a local firm, have secured the contract for the electrical work for the forthcoming Pageant at Dover.

Heckmondwike.—The U.D.C. has accepted the offer of the General Electric Co., Ltd., for the hire and purchase of motors and apparatus for hiring out.

Falkirk.—The Chloride Electrical Storage Co., Ltd., have received instructions to replate the existing battery and supply an "Ents" booster and switchboard for use in connection with the three-wire lighting system. The "Ents" booster is similar to those which are already working at Greenock, Halifax, Llandudno, &c.

Glasgow.—The Tramways Committee has recommended for acceptance the following offers for extra high-tension testing apparatus required in the laboratory. Messrs. Kelvin & White, Ltd., £30 12s. and Messrs. Elliot Bros., £313 17s. 6d.

For the Port Dundas generating station the following have been recommended for acceptance:—

Gilbert, Little & Co.—Coal and ash conveyer, £858.
Musgrave & Co.—Induced draught fan, £500.
E. Green & Co.—Fuel economisers, £1,378.

The T.C. Committee on Works and Stores recommended the following:—

Hadfield's Steel Foundry Co., Ltd.—Special track-work, junction of Dumbarton Road and Church Street.
P. & R. Fleming & Co.—Tiebars.
Micanite and Insulators Co., Ltd.—Mica.
Ruberoid Co., Ltd.—P. B. paint.
Brownlee & Co., Ltd.—Pitch-pine sleepers.
Continuous Rail-joint Co. of Great Britain, Ltd.—Continuous rail-joints.
Albion Clay Co., Ltd.—Sykes conduits for cables.
Key Engineering Co., Ltd.—Fibre conduit.
Howard Asphalt Troughing Co., Ltd.—Asphalt troughing.
British Insulated and Helsby Cables, Ltd.—Cables.

London.—The Metropolitan Asylums Board accepted on Saturday the tenders of the following firms for annual supplies of electrical accessories:—

General Electric Co.; Pryke & Palmer; G. Braulik; Sterling Telephone and Electric Co.; British Insulated and Helsby Cables, Ltd.; W. T. Henley's Telegraph Works Co., Ltd.; Edison & Swan United Electric Light Co., Ltd.; Davies, Kent & Stewart, Ltd.; Callender's Cable and Construction Co., Ltd.; Connolly Bros.; India-Rubber, Gutta-Percha, and Telegraph Works Co., Ltd.: Goossens, Pope & Co.; Sunbeam Lamp Co., Ltd.; Cryselco, Ltd.; H. G. Mayer & Co; A. P. Lundberg & Sons; Galsworthy, Ltd.; J. H. Tucker & Co.; London Electric Wire Co., Ltd.; Siemens Bros. & Co., Ltd.; Heap & Johnson; G. McLellan & Co.; Macintosh and Co., Ltd.

The Metropolitan Asylums Board has accepted the tender of Edmundson's Electricity Corporation, Ltd., at £194 (less 5 per cent. to the builder), for wiring and fitting for electric lighting the Belmont Laboratory, Sutton, Surrey.

The L.C.C. has conditionally decided to extend existing contracts with W. Manders for roadwork and platelaying, and with Hadfield's Steel Foundry Co. for special trackwork in connection with the reconstruction of the tramways in Lea Bridge Road when the purchase of the lines has been sanctioned by the Board of Trade; and to accept the offer of the Leyton U.D.C. to supply and erect the overhead equipment for the cost price of the material and labour, plus 10 per cent. A similar extension of contract with Dick, Kerr & Co., at an estimated cost of £3,160, has been resolved upon in regard to the provision of overhead equipment for the tramways from Brixton to Camberwell Green.

The following tenders have also been considered by the L.C.C.:—

Wiring of Hackney Carshed.

Jenkins & Cawte	£702
A. C. Smith, Engineers, Lincoln, Ltd.	775
Perry & Co. (accepted)	911
S. J. Suter & Wood	961
W. G. Cannon & Sons	1,011
Pinching & Walton	1,015
Comyn, Ching & Co.	1,059
G. Weston & Sons	1,158
G. E. Taylor & Co.	1,190
Cross & Cross	1,209
H. J. Cash & Co.	1,245
Tilley Bros.	1,398

Centrifugal Pumps for Greenwich Station.

Dick, Kerr & Co. (accepted)	£3,320
General Electric Co.	3,333
British Electric Plant Co.	3,335
Drysdale & Co.	3,358
Worthington Pump Co.	3,375
General Electric Co. (alternative tender)	3,375
British Westinghouse Co.	3,379
Worthington Pump Co. (first alternative tender)	3,406
Dick, Kerr & Co. (alternative tender)	3,415
Electric Construction Co.	3,501
Worthington Pump Co. (second alternative tender)	3,530
Thomas Parker, Ltd.	3,706
John Cochrane	3,757
Gwynnes, Ltd.	3,866
Greenwood & Batley, Ltd. (alternative tender)	4,004
" "	4,074
Entwistle & Gass, Ltd.	4,349

Motors and Transformers for the Central Car Repair Depot.

Electric Construction Co. (accepted)	£427 10
British Westinghouse Co.	468 0
General Electric Co.	595 16
Dick, Kerr & Co. (incomplete tender)	—

The accepted tender is for eight three-phase motors and four auto-transformer starters, and the British Electric Transformer Co. is to supply four single-phase static transformers for the sum of £328.

Bermondsey.—The following tenders have been accepted for plant extension:—Boiler, Babcock, & Wilcox, £2,025; steam dynamo and Howden engine, £4,828; condenser and cooling tower, Deane & Beal (25 in.), evaporative, £3,374.

Portsmouth.—The E.L. Committee of the T.C. has accepted the tender of the British Thomson-Houston Co., Ltd., for the supply of 200 meters.

River Plate.—The contract for chimneys required by the River Plate Electricity Co., of La Plata (Argentina), has been given to the Ferbeck Chimney Construction Co., it having been found, we are informed, that their patent perforated brick built chimneys can be erected at a lower price than steel chimneys.

Southend-on-Sea.—The T.C. has accepted the following tenders:—

Ferranti, Ltd.—Meters.
Stone & Co.—Condenser pipes, £8 per ton.
Edgar Allen & Co.—Bends, £95; bends and crossings for extensions, £445.
R. W. Blackwell & Co., Ltd.—Permanent-way of tramway extension to Halfway House, £1,720; rail bonds, £42; poles, £166; brackets, £56; bases, £67; trolley wires, £155; overhead fittings, £49.
H. Gielgud (Société Anonyme des Acieries Angleur, Belgium).—Tram rails (160 tons), £6 2s. 6d. per ton; fish-plates, £8 2s. 6d. per ton.

West Ham.—The B.C. E.L. and T. Committee has received the following tenders for the supply of a 3,000-kw. turbo-generator:—

Electrical Co.	£11,400
Richardsons, Westgarth-Brown, Boveri	9,675
Richardsons, Westgarth-Parsons	9,400
Electric Construction Co.-Richardsons, Westgarth	9,400
Richardsons, Westgarth-Electric Construction Co.	9,300
Willans & Robinson-Dick, Kerr	9,182
Howden-Dick, Kerr	8,865
Howden-Westinghouse	8,750
General Electric Co.-Richardsons, Westgarth	8,745
Richardsons, Westgarth-Dick, Kerr	8,520
Howden-Siemens	8,500
Parsons-Parsons	8,184
Richardsons, Westgarth-Siemens	8,175
Electric Construction Co.-Parsons	7,704
Parsons-Dick, Kerr	7,494
General Electric Co.-Parsons	7,319
British Westinghouse Co. (provisionally accepted)	6,100

The contract with the British Westinghouse Co. is to provide for delivery in five months, with two years' maintenance, and to contain clauses giving to the Council the option of purchasing a further similar turbo-generator within two years for £6,800. The electrical engineer's estimate for the first of these two turbo-generators amounted to £10,000.

Worksop.—The U.D.C. has accepted the following tenders:—

E. Green & Son, Ltd., Wakefield.—Fuel economiser, £250.
Tinkers, Ltd.—Repairs to boiler, £30.
Flamwell & Sons, Worksop.—Rubber valves, 4s. per lb.
Venner & Co.—Meters.

CONTRACTORS' COLUMN.

[The following information is published in the interests of electrical contractors and others who are seeking for openings for new business. Considerable expense is incurred in the production of this column, and every care is taken to ensure that the information is new and accurate, but it will be understood that in a matter where so many correspondents are engaged, and where the amount of information to be handled is very large, this cannot always be guaranteed. If alleged inaccuracies are reported to the Editors, they will be fully investigated.]

ABERDARE.—Houses, Gospel Hall Terrace, for R. Charles; Glynhafod Street, for the Glynhafod Building Club; Harriet Street, Trecynon, for D. W. Price, The Ivies.

ABERDEEN.—Reconstruction of the Halls of Trinity Church. Rev. J. Adams, minister; new dwelling-house, at Pocra Quay; R. G. Nicoll, harbour engineer, Aberdeen.

ACCRINGTON.—Additions to Stephenson Memorial Club. Grimshaw and Cunliffe, architects, Bank Buildings, Accrington.

ALDERSHOT.—Proposed extensions at the parish church (£7,000 or £8,000).

AYLESBURY.—Villa, Manor Park, for J. Eggleston; alterations to premises, Market Square, for Boot & Co., Ltd., chemists.

BARNSLEY.—Extensions to the Mapplewell and Staincross Institute; two houses for G. O. Pye, Belle Vue, Mapplewell; 64 houses at Cudworth, for G. H. Gray.

BEDFORD.—Houses, Honey Hill Road, G. Burton & Sons, builders, Waldeck Avenue, Bedford; Churchville Road, B. Litchfield & Son, builders, Ombersley Road, Bedford; Winifred Road, R. Jeakings, builder, 128, Hurst Road, Bedford; York Street, for H. J. Jones, builder, 131, Castle Road, Bedford; Pemberley Avenue, P. J. Dunstall, builder; Honey Hill Road, T. Ebden, builder, Gladstone Street, Bedford; Honey Hill Road, for J. Corby & Son; business premises, St. Peter's Street, for the Ceylon and Indian Tea Co., Ltd.; and High Street, for Geo. Haynes, The Embankment, Bedford; houses and stables, Denmark Street, D. Francis, builder, 65, Foster Hill Road, Bedford; additions to residence, Park Avenue, for Col. Dimmock; additions to 24, St. Peter's Street, for the Directing Board of the Moravian Church.

BELPER.—Additions to the Isolation Hospital, Heage Common. Hunter and Woodhouse, architects, Belper.

BELVEDERE.—Boiler shop, Glendale Iron Works, for H. Harris & Sons.

BEXHILL.—Dwelling-house, St. George's Road. Mrs. Plummer, owner; C. E. Plummer, architect.
Dwelling-house, Heatherdune Road. H. D. Sketchley, owner; E. Shearman, architect.

BIRKENHEAD.—Congregational Church, lit by electricity, at Prenton. T. W. Cubbon, architect, 54, Hamilton Street, Birkenhead; W. H. Forde, builder, Claughton Road, Birkenhead.

BIRTLEY (Durham).—Probable extensions and improvements at ironworks. Co-operative Wholesale Society, Manchester.

BLACKPOOL.—New dressing and retiring rooms and other improvements for Blackpool Football Club.

BODMIN.—Residence in St. Nicholas Street. Menear Oliver, architect, Bodmin.

BOYNDLIE (Aberdeenshire).—Additions to steading at Upper Boyndlie. J. Blake, architect, New Pitsligo.

BRIGHTLINGSEA (Essex).—New Salvation Army Hall, Tower Street. H. Lord, architect.

BRISTOL.—Business premises, Exchange Avenue, to be rebuilt, for Geo. Cornor & Co. and the Metropolitan Bank of England and Wales Ltd. (£7,000).

BRIXHAM (Devon).—Residence, Berry Head Road, for Chas. Hellyer, J.P. Lamwath Hall, Sutton-on-Hull, and York Lodge, Brixham. F. W. Vanstone, architect, Palace Chambers, Paignton.

BRYNMAWR.—Twenty houses for the Brynmawr Building Club. H. B. Jones, architect, Brynmawr.

BURNLEY.—Extension of the electricity works for the T.C. G. H. Pickles Town Hall, Burnley.

BURSLEM.—Extensions to residence, High Lane. R. T. Longden, architect, Market Place, Burslem.

BURTON LATIMER (near KETTERING).—Engine and accumulator house at the Rectory.

BUXTON.—Proposed new Primitive Methodist Church (£2,000). Rev. J. Hancock, minister.

CANNOCK (STAFFS.).—Extension of the Union offices. Mr. Veale, architect.

CARNARVON.—Alterations at "Murian" for John Davies. E. F. White, architect, 17, Bridge Street, Carnarvon.

CARSHALTON.—Road, adjoining Westmead Road. A. Ross, "St. Clement," Carshalton Road.

CASTLETON (YORKS.).—Proposed parish room. Rev. J. H. Brooksbank, Vicar of Castleton.

CHELMSFORD.—New church, lit by electricity (£6,000). W. Hayne, architect, Frinton-on-Sea; A. E. Farr, builder, Frinton-on-Sea.

CHULMLEIGH.—Alterations to the Stores, High Bickington. S. Edwards, architect, Barnstaple.

CLEVELEYS (near BLACKPOOL).—Two houses, Queen's Walk, Mr. Barker; house in Stockdove Way, Mr. Jenkin; houses in West Drive for T. Croft and T. Griggs.

COLSTERWORTH (GRANTHAM).—New Wesleyan Sunday Schools. Withers and Meredith, architects, London; D. Parks & Son, contractors, Grantham.

COLERAINE.—New Orange Hall contemplated (£1,000).

CORK.—Improvements to Nos. 83 and 84, South Main Street, for Messrs. O'Callaghan. W. H. Hill & Son, architects, 28, South Mall, Cork.

CORSHAM (WILTS).—Additions to "The Ridge" for C. E. Hobhouse, M.P.

COVENTRY.—Depôt at Spon End Waterworks (£960). Orr Bros., builders, Foleshill.

CRANBROOK.—Pair of semi-detached villas. W. Brooks, architect, Staplehurst, Kent.

CROYDON.—Temporary school at Wallington. Architect, Surrey Education Committee.

CUPAR (FIFE).—Extensive additions to Castlehill School. H. A. Newman, architect, Crossgate, Cupar.

Alterations and improvements on premises of Laird & Smith, seedsmen, in St. Catherine Street, Cupar.

DARNALL (YORKS.).—Wesleyan Methodist Church (£2,500).

DENBIGH.—Ammonia works. W. E. Brock, secretary, Gas and Water Co. Denbigh.

DERBY (OCKBROOK.)—Alterations and additions to the Moravian Boys' School.

DINNINGTON (near ROTHERHAM).—House and shop for W. Knowles, Rotherham Road; stables, for Mr. Coupe.

DISLEY (CHESHIRE).—Proposed Council school. F. May, clerk to the Committee for the Macclesfield and Hayfield Unions area, 43, Churchside, Macclesfield.

DONAGHMORE (DERRY).—Renovation of the Presbyterian church. J. M'Intyre, architect, Letterkenny.

DONCASTER.—Additions to Hyde Park school, for the Corporation. Borough surveyor, Town Hall, Doncaster.

DONEMANA (Co. TYRONE).—New Orange Hall.

DOUNE.—Public slaughter house for Town Council. Town Clerk, Doune.

DUBLIN (IRISHTOWN).—Dispensary and Compounder's residence. P. H. M'Carthy, architect, 39, Westmoreland Street, Dublin.

DUDLEY.—Probable developments at iron works in Charlotte Street. Co-operative Wholesale Society, Manchester.

EAST BARNET VALLEY.—Four houses, Spencer Road, Betstyle Estate. Moore & Neild, architects, 20, New Bridge Street, E.C.

EASTLEIGH (HANTS.).—School (accommodate 400). W. J. Taylor, county surveyor, The Castle, Winchester.

FARNBOROUGH (HANTS.).—Houses, Avenue Road, Farnborough Park, for Lieut.-Col. Carlyon; Victoria Road, for T. Moore; Victoria Road, for Mrs. Dever; Church Road, for Miss E. M. Barnard.

FARNWORTH (near BOLTON).—Addition to houses in Longcauseway for J. Morgan; houses on Larkhill for F. W. Coope; offices in Highfield Road for Lord Ellesmere; houses in Campbell Street for D. Gornall; shed in Campbell Street for Bolton Textile Co.; 18 houses in Kildare Street for Mr. Walsh.

FELIXSTOWE.—Floral Hall for the U.D.C. (£3,000). H. J. Linzell, builder, Felixstowe.

FERNDALE (GLAM.).—Bakery, stores, and engine room for suction gas-driven electric plant for the Ferndale Industrial Co-operative Society, Ltd. W. M. Lewis & Morgan, architects, Pontypridd.

FLEET (HANTS.).—Roman Catholic Church, Station Road; additions to the St. Kilda, for Mrs. Bailey.

FOCHABERS.—Alterations on Gordon-Richmond Estates. D. J. Cunningham, factor.

FROSTERLEY (Co. DURHAM).—Parish Hall. V. A. Rippon, Rogerley Hall, Frosterley.

GELLIGAER.—Houses, Bedlinog, for E. Powell; Bedlinog, for Daniel Davies; Higher Elementary School, for Glamorgan C.C.

GLASGOW.—Church Hall in Kilmarnock and Newlands Roads, Newlands (£1,500). P. M'Gregor Chalmers, architect, Bath Street, Glasgow.

United Free Church at Govanhill. Rev. P. Clarkson, Aberfeldy U.F. Church.

(RUTHERGLEN).—Alterations and extensions to Rutherglen Town Hall. Town Clerk, Rutherglen.

GLASSEL.—Alterations and new works at farms, &c. Davidson & Garden, 12, Dee Street, Aberdeen.

GREAT CROSBY.—Houses, Asquith Street, for Mrs. Copestake; Abbotsford Road, for Miss Ada Burnwell; Sherwood Road, for R. Costain and Sons; Sherwood Road for J. Bollard.

HAMILTON (N.B.).—Shops, dwelling houses and offices in Cadzow Street, for J. C. Cooper. Alex. Cullen, architect, Hamilton.

HARPENDEN (HERTS.).—Additions to The Lodge, for R. Lydekker; stable and coach house, Harpenden Rise, for A. E. Messer.

HAWARDEN (CHESHIRE).—Premises at Ewloe, for the Hawarden and District Co-operative Society. R. Worcester, architect, Co-operative Wholesale Society, Ltd., Manchester.

HEBDEN BRIDGE.—Restoration of Thomas à Becket Church, Heptonstall (£1,100). Rev. E. O. Williams, Vicar of Heptonstall.

HERNE BAY.—Additions to printing works, for Hanbrook & Sons; temporary church, Mickleburgh Hill, for Rev. A. G. Daubeney.

HIGH WYCOMBE.—Additions to Works, Upper Marsh, for Bateman Davies; business premises, Church Street, for H. J. Cox; showroom, &c., Abercromby Avenue, for Joynson, Holland & Co.

HOUGHTON-LE-SPRING (Co. DURHAM).—Houses, Lumley Street, Grasswell, for J. H. Wood; Station Avenue, near Fence Houses, for H. Lamb.

HUDDERSFIELD.—Ten houses, Beaumont Street, Mold Green. J. Berry, architect, 3, Market Place, Huddersfield.

HULL.—Central Hall, for the Wesleyan Methodists in Great Thornton Street.

HUNSDON (HERTS.).—Alterations and additions to mansion at Briggins Park, for the Hon. H. Gibbs.

ILFORD.—Extension of the Isolation Hospital, Chadwell Heath, for the U.D.C. H. Shaw, surveyor Town Hall, Ilford.

INCE.—Houses, Shed Street, Lower Ince, for John Taylor; Anderton Street, for John Occleshaw; alterations and additions to Crown Inn, for the Oldfield Brewery Co., Poolstock, Wigan.

INVERURIE.—Proposed extension of Town House. Town Clerk, Inverurie.

ISLEWORTH.—Additions to Workhouse. Fleetwood, Son, & Everaden, surveyors, 8, New Court, Carey Street, W.C.

KEARSLEY (BOLTON).—Block of houses in Bolton Road. A. Wolstenholme.

KEIGHLEY.—Probable development of ironworks in Prospect Street. Co-operative Wholesale Society, Manchester.

KEITH.—Commercial Bank extensions; Manager, Commercial Bank, Keith. Shelter for Consumptives at Hospital; Medical Officer, The Hospital, Keith.

KENDAL.—Two houses, Kentrigg, Burneside Road. W. A. Nelson, architect, Kendal.

KIVETON PARK (near SHEFFIELD).—Houses, North Anston, for Mrs. Rowbotham; Wales, for Countess of Yarborough; North Anston, for J. Widdison and Mr. Reynolds.

KNARESBOROUGH (SCOTTON).—New Sunday Schools and renovation of the Chapel. Bland & Bown, architects, North Park Road, Harrogate.

LIVERPOOL.—New shop premises in Bold Street. W. Tomkinson & Sons, builders and contractors, 21, Dansie Street, Liverpool.

Business premises in Great Charlotte Street. R. J. Bracker, Lord Street, Liverpool.

LLANDUDNO.—Three houses in Llwynon Road. J. R. Thomas, builder, The Rock, Llandudno.

LLANIDLOES.—Council School at Aberhafesp (£1,155). J. J. Meredith, builder, Llanidloes.

LLWYNYPIA.—Chapel, school, classrooms, &c. R. S. Griffiths, architect, Tonypandy.

LOCHGILPHEAD.—New United Free Church.

LONDON.—(ACTON, W.).—School at Acton Wells, Victoria Road, for the U.D.C. E. C. P. and H. Monson, architects, 183, High Street, Acton, W.

(WANDSWORTH, S.W.).—Infirmary buildings in St. James Road. J. S. Gibson, architect, 5, Old Bond Street, London, W.

(STREATHAM, S.W.).—Development of new streets for the British Land Co., Ltd., 25, Moorgate Street, E.C.

(E.C.).—Buildings in Little Britain. G. Vickery, architect, 96 Queen Street, E.C.

(ISLINGTON, N.).—Buildings, Hornsey Rise and Upper Hornsey Rise. E. Bates, architect, 2, Imperial Buildings, Croydon.

(WANDSWORTH, S.W.).—Buildings. W. Mulliner & Son, builders, 1, Crieff Road, Wandsworth, S.W.

(DEPTFORD, S.E.).—Working class dwellings in Church Street. W. H. Gritten, 1, Freeman's Court, Cheapside, E.C.

(WHITECHAPEL, E.).—Working class dwellings. Gilbert and Constanduros, architects, 43, Finsbury Square, E.C.

(E.C.).—Building in Old Bailey. P. Hoffmann, architect, Capel House, New Broad Street, E.C.

(WANDSWORTH, S.W.).—Houses, Burntwood Lane, Herondale Avenue, and Loxley Road. Holloway Bros., builders, 19, Belvedere Road, S.E.

(SOUTH TOTTENHAM, N.).—Installation of electric light at North-Eastern Hospital (£4,500). W. T. Hatch, engineer, Metropolitan Asylums Board, Embankment, E.C.

(STRATFORD, E.).—Additions and alterations to 77, Leytonstone Road. C. H. Deer, builder, 81, Great Dover Street, S.E.

(PLAISTOW, E.).—Twenty-three houses and shop. M. A. Haines, builder, 241, Plashet Road, Stratford, E.

(CANNING TOWN, E.).—Additions to bakehouse, Exeter Road. S. Ford, architect, 3, South Square, Grays Inn, W.C.

(MARYLEBONE, W.).—Motor house, Finchley Road. Anscombe and King, land agents, 8, Wellington Road, N.W.

(WANDSWORTH, S.W.).—Buildings, Upper Tooting Road. W. C. Poole, architect, 62, Belleville Road, Wandsworth Common.

(CANNING TOWN, E.).—Additions to sheds at Crown Wharf, for W. W. Howard Bros., timber merchants.

(SILVERTOWN, E.).—Store shed for Co-operative Wholesale Society, Ltd., Thames Road.

(WEST HAM, E.).—Extension of electric light installation at Abbey Mills pumping station. Maurice Fitzmaurice, chief engineer, L.C.C., Spring Gardens, S.W.

(N.).—Structural alterations to the Crouch End Hippodrome.

(HORNSEY, N.).—Completion of Parish Church. Rev. F. N. Thicknesse, The Rectory, Hornsey, N.

(HIGHGATE, N.).—Three dwelling houses, View Road. E. H. Stafford, Stroud Green.

(MUSWELL HILL, N.).—Forty-four houses, Springcroft Avenue. W. J. Mathieson, 46, Queen's Avenue, Muswell Hill.

(MUSWELL HILL, N.).—Seven houses. W. J. Collins, 13, Fire Parade, Muswell Hill.

(BARNES, S.W.).—Five houses, Vernon Road. Chas. Ellis & Co., agents, 176, Upper Richmond Road, East Sheen.

(BARNES, S.W.).—Development of Lowther Estate. S. Gambier Parry, architect, 34, Victoria Street, S.W.

(BARNES, S.W.).—Motor sheds. F. W. Dunkley, builder, Church Road, Barnes.

(PLAISTOW, E.).—Additions to Mission Hall, Boundary Road. F. Hamlett, builder, Cotswold Works, Barking Road, E.

(SILVERTOWN, E.).—Additions to soap store for Knight & Sons. J. G. Horlock & Son, builders, Barking Road, E.

(W.).—Building in North Audley Street. R. G. Hammond, architect, 16, Essex Street, Strand, W.C.

(SHEPHERD'S BUSH, W.).—Shop, Bulwer Street. E. Monson & Sons, architects, Grosvenor House, Acton Vale, W.

(E.C.).—Buildings, Salisbury Square. F. W. Foster, architect, 41, Bedford Row, W.C.

(NEW SOUTHGATE, N.).—Remodelling of internal telephone arrangements at Colney Hatch Asylum (£500). W. C. Clifford Smith, chief engineer, L.C.C. Asylums, Dept. 6, Waterloo Place, S.W.

(BERMONDSEY, S.E.).—Dwelling houses in Willow Street. E. Crosse and Co., architects, 11, Bermondsey Square, S.E.

(VICTORIA STREET, S.W.).—Shop. T. Ballantine, architect, 86 to 90, York Street, Westminster.

(KENNINGTON, S.E.).—Stables, manager's house, van sheds, &c., for Birch Bros. P. Dollar, architect, Clock House, Arundel Street, W.C.

(HOLBORN, W.C.).—Additions, &c., to Children's Hospital, Great Ormond Street. C. E. Barry, architect, Parliament Mansions, S.W.

(LEWISHAM, S.E.).—Development of Forster Estate. J. Everington, surveyor, 31, Bromley Road, Catford.

(MARYLEBONE, W.).—Re-erection of 27 and 28, Harcourt Street. E. W. Coldwell, architect, 9, Southampton Street, Bloomsbury, W.C.

(MUSWELL HILL, N.).—Four houses in Colney Hatch Lane. F. W. J. Cutlan & Son, builders, 18, Muswell Avenue.

(MUSWELL HILL, N.).—Additions, &c., to premises, 3, Station Parade. R. M. Dracass & Son, 72, Grove Road, Holloway.

LOSSIEMOUTH (Aberdeenshire).—Chemical laboratory and classroom at the Lossiemouth School.

LUMPHANAN (Aberdeenshire).—Alterations and new buildings on Estate of Lumphanan. Geo. Cocker, Estate Ground Officer, Lumphanan.

LYTHAM.—New vestries at St. Cuthbert's Church. Austin & Paley, architects, Lancaster.

MALVERN.—Proposed new school at Malvern Links. Local Education authority,

MANCHESTER.—Proposed new institute at Flixton (£1,250). Proposed structural alterations at the Snug Tavern, Dickenson Street. Mr. Taylor, licensee.

MARGAM.—Houses, Bryn, for D. C. Evans; Charles Street, Port Talbot, for T. Evans & Sons; Bridge Street, for J. Thomas; Bridge Street, for J. Nicholas.

MARGATE.—Proposed improvement of shops in Queen Street, for Bobby and Co., Ltd., drapers, &c.

MATLOCK BATH (Birchover).—Rebuilding Birchover Wesleyan Reform Union Church.

MERTHYR TYDFIL.—Houses, Gorsedd Circle, for N. Moss; Angus Street, Aberfan, for R. E. Rees; Perrott Place, for J. Lewis, Treharris; Hanover Street, for Richard Lloyd; The Walk, Pennydarre Park, for John Williams.

MOIRA (Co. Down).—New National School at Craigmore. J. St. J. Phillips, architect, 16, Donegall Square South, Belfast; Law Bros., builders, Lisburn.

MIDDLESBROUGH.—New arcade of shops for Dickson & Benson, Ltd., drapers and furnishers.

MITCHAM.—Mission Hall, Gorringe Park Avenue, for City of London School.

NELSON.—Public Baths in Bradley Road (£10,500). Borough Surveyor, Town Hall, Nelson.

NEWCASTLE-ON-TYNE.—Isolation Wards for Children at the Workhouse, Westgate Road. Newcombe & Newcombe, architects, 89, Pilgrim Street, Newcastle-on-Tyne.

NEWPORT (Salop).—New Institute at Edgmond. J. H. Ward, architect, Newport, Salop.

NORTHALLERTON.—Proposed New Church at East Cowton (£1,500). Rev. R. Gifford-Wood, vicar.

NORTHWICH.—Additions to Moulton Schools (£1,114). T. Astles, builder, Northwich.

NOTTINGHAM.—New Eye Infirmary (£8,000). J. Howitt, architect, Bentinck Buildings, Wheeler Gate, Nottingham.

NUNEATON.—New Schools at Coton for the T.C. E. E. Shepherd, architect, Nuneaton.

OBAN.—Additions to St. Columba Roman Catholic School. Priest-in-Charge, St. Columba's, Oban.

OGMORE VALE (Bridgend).—Workmen's Hall and Institute. Fred. Jones, secretary, 1, Meadow Street, Ogmore Vale.

OSWESTRY.—Bungalow residence at Craignant, for Mrs. Barnes; four houses, The Drill, for E. Griffiths, Sweeney Mountain; villa residence at Gobowen, for Mr. Foulkes, Birkenhead.

OUNDLE (Northants).—House, Glapthorne Road, for Mr. Rowell.

PEGSWOOD (near Morpeth).—Extensions to shop premises, warehouses, &c., and manager's residence. L. G. Ekins, architect, Co-operative Wholesale Society, Ltd., West Blandford Street, Newcastle-on-Tyne.

PENDLETON.—New offices in Eccles New Road. Salford Board of Guardians.

PENN (Bucks.).—Primitive Methodist Sunday Schools (£230).

PORTSMOUTH.—New Presbytery, corner of Tangier Road, Copnor.

PORT TALBOT.—New church at St. Agnes, for Miss Talbot. Margam Estate Office, Port Talbot.

PRESTON.—New Corporation washhouses and baths (£16,000).

RAWMARSH.—Houses, Infirmary Road and Thrybergh View, for F. Powell.

RAWTENSTALL.—Houses, Haslingden New Road, for Henry Tomlinson.

REDCAR.—Alterations and additions to Council Schools for the North Riding of Yorks C.C. J. C. Wrigley, secretary to the Education Committee, Northallerton.

REIGATE.—Probable re-erection of new factory (after fire) at the Clears, for G. Taylor, Kingswood.

RISHTON (Lancs.).—Alterations to Wesleyan Sunday Schools. J. Thornley, architect, Market Street, Darwen.

ROCHDALE.—New billiard hall (nearly £4,000). Secretary, Temperance Billiard Hall, Ltd., Pendleton, Manchester.

ROMFORD.—Additional office accommodation for guardians. Architect, care of Clerk to Guardians, Romford.

ROTHERHAM.—Extensions to Holmes' Rolling Mills, for J. J. Habershon and Sons; alterations and additions to Grove House, for W. Dyson, Moorgate Grove; additions to workshops, for Robert Jenkins & Co., boiler manufacturers, Wortley Road; houses, Cavendish Road, for Joseph Hindeley; Gerard Road, for A. E. Watson; Ewers Road, for W. and T. W. Reading; South Street, for S. L. Frugone; St. Anns Road, for Chas. Green and Sons, builders, Wellgate; Broom Grove, for Wm. Thornton; Bramwell Street, for Herbert James; Radcliffe Street, Templeboro', for G. M. Barber; Wortley Road, Thorpe Common, for Miss Midgley; Kimberworth Road, for W. Twigg; Kimberworth Road, for Alfred Hart.

RUGBY.—Houses, Benn Street, for Mr. Watford; Claremont Road, for Linnell and Son; Cromwell Road, for G. Warner; restoration of Dunchurch Parish Church (£3,600).

RUSHDEN.—House, Newton Road, for T. Wilmott; new factory, Essex Road, for Knight & Brightwell.

ST. AUSTELL.—Two houses for Nicholls, Hallaze, St. Austell; house at Molinnis, St. Austell, for Warne Bros., Bugle, St. Austell; eight houses, for A. Borlase, Stenalees, St. Austell.

ST. STEPHENS-IN-BRANNELL.—House for J. B. Fortescue, J.P., Boconnoc, Cornwall.

SANDERSTEAD (Surrey).—Two pairs of houses, Mayfield Road. F. Handscombe, builder, London Road, Croydon.

SETTLE.—School at Low Bentham for the West Riding Education Committee. J. Vickers-Edwards, county architect, County Hall, Wakefield.

SHEERNESS.—Houses, Alexandra Road, for Mr. Wheatcroft; Clyde Street, for T. R. Milway; Alexandra Road, for T. Lupton.

SHEFFIELD.—Alterations and additions to the Union Offices, Westbar, for the Guardians of the Poor. J. Creswick Brameld & Son, architects, 4, York Street, Sheffield.

Public Elementary School at High Wincobank. G. A. Wilson, architect, Hartshead Chambers, Sheffield.

Place of worship at Attercliffe. Ardern & Son, builders, Spital Hill, Sheffield.

SHEPHERDSWELL (near Dover).—House. M. J. Morgan, contractor, 55, Church Road, Maxton.

SHEPTON MALLET (Wanstrow).—Alterations and improvements at Wanstrow School. Cottam & Samson, architects, 43, High Street, Bridgwater.

SKELMERSDALE (Lancs.).—New coal seams to be tapped at Almond Colliery. J. Hough.

SMETHWICK.—Houses, Bowden Road, for T. W. Evans; Sydenham Road, for Mrs. C. Jones; Talbot Road, for Goodwin & Jennings; Shops, Sandon Road, for H. Powell.

SOUTHEND-ON-SEA.—Houses, London and Nelson Roads, A. D. Martin, builder, Finchley Road, Westcliff; Princes Street, for W. J. Lincoln; Leigh Road West, for Chas. May; South Church, Beach Road, for T. Cooper; Recreation Avenue, for A. E. Halliday; North Avenue and Bournemouth Park Road, for A. O. Moore; North Avenue, Westcliff, for W. Robinson; Southchurch Beach Parade, for W. Clark; Crowstone Road, for J. A. King; Wenham Drive, for S. Riley; houses, Park Road, for E. C. White; Christchurch Road, for J. Sears; Gainsborough Drive, for T. Wiggins; The Leas, for J. Bane; Winter Avenue, for W. Dale; Leigh Road East, for T. Brand; Cranley Road, for W. Jones, jun.; Leigh Road, for R. Alabaster; house and shop, Westborough Road, for Mrs. A. Osmont; bungalows, for J. W. Palmer, Fairmead Avenue, and A. E. Day, Grasmead Avenue.

STIRLING.—Restoration of West Church (£2,350).

Tenement of shops and dwelling houses in Barnton Street. M'Luckie & Walker, architects, Stirling.

STOCKPORT.—Congregational Church at Reddish.

STOCKTON-ON-TEES.—Enlargement of the Post Office. Secretary, H.M. Office of Works, Storey's Gate, London, S.W.

STONE.—New Wesleyan Church in London Road.

STONECLOUGH.—Proposed Council School in Market Street, Stoneclough, Kearsley, Bolton. Lancs. Education Committee.

STRICHEN (Aberdeenshire).—Additions and alterations for public school. Wm. Cheyne, 79, High Street, Fraserburgh.

SUTTON-IN-ASHFIELD.—House and shop, Outram Street, for W. Kirk; houses, Garden Lane, for Miss Fletcher.

SWANSEA.—Rebuilding of business premises, High Street, for D. Jones & Co., Ltd., clothiers; alterations and improvements at the Hospital, for the Hospital Board (£1,075); new offices, Prince of Wales Dock, for the Harbour Trust.

SYDENHAM.—Stables and coach-house, Dacres Road. Bingham & Broughton, architects, Crofton Park, S.E.

TAMWORTH.—Proposed Laundry at Workhouse. F. W. Rudgard, Chairman of the Board of Guardians, Tamworth.

TREHERBERT.—Workmen's Institute at Tynewydd. J. D. Walters, architect, Maesgwyn, Treherbert.

TURRIFF.—New Municipal Buildings. Mr. Duncan, architect, Turriff.

TYLDESLEY (Lancs.).—Library in Stanley Street for U.D.C. W. J. Matthews, Clerk, Council Offices, Tyldesley.

TYWARDREATH (Cornwall).—Two houses at Tywardreath and two houses at Par Green for T. B. Rundell, Tywardreath.

WAKEFIELD.—Renovations and repairs at the Registry of Deeds Offices for the W. Riding County Council. J. Vickers-Edwards, county architect, County Hall, Wakefield.

WARE.—Houses at Standon for R. Long; additions to Stanstead Abbotts Congregational Church. E. Chinnock, architect, 1, Trinity Road, Ware.

WARWICK.—Houses, Linen Street, for W. J. Dunn; Emscote Road, for Mr. Hirons.

WATFORD.—Additions to Bank in High Street. Lloyds Bank Ltd., Lombard Street, E.C.

Development of Horton's Meadow Estate. C. Brightman & Son, builders, Queen's Road, Watford.

Two houses with shops, St. Alban's Road, and six shops, The Bridle Path. C. Brightman, builder, Queen's Road, Watford.

Two houses, Nascot Estate. J. Tyler, builder, Vicarage Road, Watford.

WHITECAIRNS (Aberdeenshire).—House at Smithy Croft. G. B. Mitchell, architect, 148, Union Street, Aberdeen.

WIGAN (Orrell).—Houses, Gathurst Road, for Thos. Worthington.

WINSFORD (Cheshire).—Business premises, Ways Green, for the Co-operative Society. Wm. Fryer, secretary, 21, High Street, Winsford.

WOOTTON BRIDGE (Isle of Wight).—Proposed new Anglican Church, Rev. Miles Atkinson, Newport, I.W.

WORKSOP.—Houses, Netherton Road, for Mr. McCarrick.

YEOVIL.—Houses, Crofton Avenue, Chapman & Co., builders, Talbot Street, Yeovil; Crofton Park, Bird & Pippard, builders, Middle Street, Yeovil; St. Michael's Avenue, for W. Slade.

FORTHCOMING EVENTS.

Physical Society.—Owing to the sudden death of Prof. W. Cassie, one of the honorary secretaries of the society, the meeting which was to have been held at the National Physical Laboratory to-day has been cancelled.

Saturday, June 27th.—At 3 p.m. Liverpool and District Electrical Association. Visit to ss. *Orita*, Pacific S.N. Co., at Alexandra Dock.

Tuesday, June 30th.—At 10.30 a.m. Incorporated Municipal Electrical Association. Opening of Convention at University College, Nottingham. The Convention will continue until July 3rd.

Thursday, July 2nd.—At 9 p.m. Royal Society of Arts' Conversazione, at Natural History Museum.

Temperature Coefficient of the Weston Cell.—As a result of very careful and accurate measurements, the temperature coefficient of the Weston cell has been determined between 0° and 40° C. by the Bureau of Standards and presented in the form of a preliminary report at a recent meeting of the American Electrochemical Society. One important result of these tests is that some cells exhibit very considerable hysteresis, especially those which have abnormal initial values. The new value for the change in E.M.F. with temperature is summed up in the following formula:—

$$e_t = e_{20} - 0{\cdot}000040\ (t - 20) - 0{\cdot}0000009\ (t - 20)^2 + 0{\cdot}000000009\ (t - 20)^3,$$

where e_t is the E.M.F. of the cell at the measured temperature t. According to this formula, the E.M.F. has a maximum between 0° and 5°, while no such value exists in that accepted by the Reichsanstalt. It is also interesting to note that the maximum solubility of cadmium sulphate lies within the same region, and that the portable cells of the Weston type are saturated at the same temperature.

NOTES.

Midland Railway Electrification.—We are informed that the insulators used on the Morecambe-Heysham single-phase railway (described in our issue of June 12th, pp. 994, 995), were supplied by Messrs. Taylor, Tunnicliff & Co., of Eastwood, Hanley. They were made of a special brown vitreous body of Messrs. Taylor, Tunnicliff & Co.'s own formula, and are brown throughout, as distinct from the ordinary foreign method of making them in a white body covered by a brown colour or wash; they are, we understand, the largest of their kind yet made in England on the potter's wheel, the central portion being about 10¼ in. in diameter, and about 8 in. high in the finished state. With the exception of the porcelain cap on which the malleable iron ring is fixed, the insulator is made in one piece on the potter's wheel; in the interior of the head of the insulator is a screwed recess, 3 in. deep, with a 2-in. diameter thread, into which the head of the ebonite-covered steel bolt has to be fitted, and each of these has the thread cut in so as to screw freely but firmly into the head of the insulator. This thread has to be cut in the engineering department of the firm to ensure a perfect fit, so that the seating of the interior of the insulator beds firmly on the flange of the screw bolt. The two parts of the insulator—the body and the cap—have then to be cemented together, and the malleable iron ring (which is first coated with molten tin) is cemented on to the porcelain cap. The specification was that these insulators, after being immersed in water, should withstand a test of 20,000 volts under a shower of water equivalent to a rainfall of 1 in. per hour, and that the water should impinge on the insulator and bolt complete at an angle of about 45°. As each batch of 100 was completed, an official of the Midland Railway Co. visited the works to witness the testing of each insulator. The specified test was exceeded in each case by 6,000 volts, and it is to the credit of the quality of English manufacture that not a single failure or breakdown occurred during the testing of the whole of the quantity in the contract.

Willans & Robinson, Ltd.—A correspondent informs us that Messrs. Willans & Robinson, Ltd., announce that they are discontinuing their business at the Ferry Works, Queen's Ferry, and will confine their operations to Rugby.

Swimming Clubs.—As a result of the challenge from the Fulham Electric Swimming Club, which appeared in our pages a few weeks ago, that club met the Westminster Electric S.C. in a six a side team race on the evening of 17th inst. at St. George's Baths, Buckingham Palace Road. The distance was 180 yd. (30 yd. each man), and the Westminster E.S.C. won by 10 yd.

An Electric Quick-Firing Gun.—It is reported that M. Pouteause, a French chemist and engineer, has invented an electric quick-firing gun capable of discharging 1,200 projectiles a minute without the use of powder or any other explosive. We learn that there is "almost no recoil"; the reporter is more cautious than in the last instance to which we drew attention. The inventor is said to have stated that he uses polyphase currents of a relatively high frequency. We wonder whether Mr. W. S. Simpson has thought of this.

Fishing by Electricity.—The *Daily Telegraph* correspondent in Berlin says that on the Teltow Canal, on which the haulage is done by electricity, some scamp discovered that it was possible to use this agency for fishing on a wholesale scale. All that was needed was that the supply wire should be connected with another, and the end of the latter plunged into the water. The immediate effect was that all the fish within a radius of ten yards were stupefied, and could easily be caught with hand nets. It is believed that this business had been carried on so extensively before it was detected that the fishery of the canal has been seriously injured.

Live-Steam Feed Heating.—Referring to the article on this subject in our issue of May 22nd, in which a contributor credits *The Engineering Magazine* with having inserted an article by Mr. A. H. Gibson, we are informed that the magazine has not at any time had an article from that author on any subject, nor has it reviewed any article of his. We regret that the reference was incorrect.

Manchester Electrical Exhibition.—A meeting of the General Committee was held in Manchester on Tuesday, the 16th inst., in the offices on the Exhibition site, Platts Park, Fallowfield. Satisfaction was expressed at the progress which had been made in the erection of the building, the skeleton of which is now complete. The management reported that very satisfactory support was being received from all branches of the industry. Already over 100 spaces have been let, representating a total of between 140 and 150 individual exhibitors. We understand that Dr. Edward Hopkinson, of Messrs. Mather & Platt, Mr. Rushton, of Messrs. Dobson & Barlow, and Mr. W. T. Stubbs, of Messrs. Joseph Stubbs & Sons, have each accepted a seat on the General Committee as representing the allied engineering trades. Schemes for the decorating and lighting of the building inside and out were discussed, and the management were instructed to prepare plans and estimates for the same. Special arrangements are being made with the railway companies all over the country for cheap fares and excursions to Manchester during the progress of the Exhibition, and generally the scheme bids fair to be a most important event in the engineering trade in Manchester and the north of England. A further general committee meeting is to be held in the Exhibition offices on Tuesday, July 7th, by which time it is hoped that the buildings generally will be sufficiently advanced for the Press inspection. The management propose arranging for a demonstration of wireless telegraphy between the Exhibition buildings and some important town within a radius of, say, 50 miles of Manchester. This should prove a great attraction to visitors. Numerous other attractive demonstrations of electricity are also being arranged for, and the various members of the Gas and Oil Engine Manufacturers' Association, recognising the important influence which the Exhibition will have in the engineering world, have decided to arrange for a number of complete working exhibits of special plants as applied to the generation of electricity.

Electricity Supply Cricket League.—From the hon. sec., Mr. A. W. Seabright, we have received the following particulars of the points scored in this League up to and including Saturday, 13th instant:—

	Played.	Won.	Lost.	Drawn.	Points.
Kensington and Knightsbridge C.C.	7	6	0	1	13
St. James' C.C.	7	4	2	1	9
Central C.C.	4	2	2	0	4
St. Pancras Power C.C. ...	2	1	1	0	2
City of London E.C.C. ...	4	0	4	0	0
St. Marylebone E.C.C. ...	4	0	4	0	0

"Halex" Celluloid Cases for Accumulators.—A correspondent asks for the maker's name.

Central Ireland Electric Power Bill.—The Alliance and Dublin Consumers' Gas Co. have given notice of their intention to oppose this Bill before the House of Lords Committee.

Electric Power Bills for London: The Committee's Decision.—On Wednesday the Select Committee sat to give their decision with regard to the London and District Electricity Supply Bill and the London Electric Supply Bill. The chairman said:—First, as regards the London and District Electricity Supply Bill, the Bill may proceed on the assumption that the clause in substitution of Clause 75, the full text of which the Committee have not seen, is satisfactory. The Committee are of opinion that it should be provided in the Bill that a larger proportion than the one-fifth margin in Secs. 9 and 10 of the £600,000 to be subscribed in the first instance should be actually paid up within 12 months. If learned counsel does not quite understand the meaning of the Committee on the point, the Committee will give further explanation. As regards Clause 52, Sub-Clause 2, the Committee would wish to consider, when the clause comes under consideration, whether any modification of the 20 per cent. limit allowed for lighting could be made. As regards the new Clause 61A, the Committee will wish to consider whether more contributions to the renewals fund should not under certain circumstances be made obligatory. Here again, if the meaning of the Committee is not quite clear, I shall be happy to give further explanation. As regards the new Clause 61, Sub-Section 5, the Committee desire to point out that in the second schedule of the Bill, three different kinds of electrical energy are specified with three maximum prices, for there would seem to be considerable difficulty in making a comparison with a single average price. I wish this point to be considered in the discussion on this clause. Lord Welby has received a letter from the Smoke Abatement Society, which will be read and put on the notes. The committee wish to consider the points raised by the Society when the clause dealing with the subject comes under examination.

Lord Welby read the letter alluded to, which pointed out that the promoters in Sec. 3 of the Bill were proposing that with regard to its works they should not be subject to Schedule 81 of the Electric Lighting Act. The effect was that they would not be able to be proceeded against in the case of creating a nuisance by allowing the emission of black smoke from the chimney shaft.

Mr. Fitzgerald said he fully understood the point about more than a sixth of the £600,000 being paid up, but he did not quite follow what was meant with regard to the renewals fund.

The chairman said the new clause, as it stood, provided that the renewals fund should not accumulate beyond a certain extent, and they concurred in that. On the other hand, it was purely permissive, and no provision was made for an obligatory renewals fund. The Committee thought it ought to be considered whether something of that nature should not be done. There were a variety of ways in which it could be done. He did not wish to name any figures, but one way in which it might be done was to provide that when a certain rate of interest accrued it should be obligatory to pay a certain sum into the renewals fund.

Sir Ralph Littler, K.C., asked if the Committee had considered the position of the City.

The Chairman: Yes, fully. Now I come to the other Bill. The Committee have come to the conclusion that the London Electric Supply Bill may proceed, but only in respect of the following clauses, viz., Clause 35, with the omission of the Joint Committee; Clauses 45 and 46, with the omission of lines 5 to 11 on page 28; and with the addition of a clause giving power to the company to lay connecting mains through intervening areas. They consider also with reference to this later point, that what is generally known as a route clause should be inserted. Finally I have to say that the Committee wish not to consider the clauses of this Bill until the case for the Westminster and Kensington Electric Supply Bill has been gone into.

The effect of the decision of the Committee with regard to the

second Bill, is to allow the existing companies to supply in bulk from their present stations for haulage and traction purposes, and to allow the companies to enter into agreements for mutual assistance, but power to provide new enlarged or extended stations by the companies in combination is struck out, as is also the power for the establishment of a Joint Committee with representatives of local authorities.

Mr. Tinsley Jones said they had a route clause in the second Bill which he thought would satisfy the Committee.

As a result of discussion between counsel it was decided that the case for the Westminster and Kensington Co.'s Bill should be heard yesterday (Thursday), and the clauses of the London and District Bill on Monday. Opponents having amendments to clauses were ordered to deliver them to the agents of the Bill by to-night.

Institution and Lecture Notes.—FARADAY HOUSE.—A series of lectures to students on "The General Principles involved in the Economical Production of Electrical Power," by Mr. H. M. Hobart, M.I.C.E., commenced on June 18th.

ROYAL SOCIETY.—The following were amongst the papers to be read yesterday:—G. W. C. Kaye on "The Emission and Transmission of Röntgen Rays," communicated by Prof. J. J. Thomson, F.R.S. Rev. F. J. Jervis-Smith, F.R.S., on a "Further Note on a Luminous Glow Generated by Electrostatic Induction in an Exhausted Vessel made of Silica."

INSTITUTION OF MUNICIPAL ENGINEERS.—It is reported by our contemporary, *The Surveyor*, that a new society has been formed with this title. At a general meeting of the Institution recently, a General Committee was appointed with Mr. Frank Latham, borough surveyor of Penzance, as honorary treasurer, and Mr. B. Wyand as secretary. The membership roll contains nearly 200 names.

LIVERPOOL AND DISTRICT ELECTRICAL ASSOCIATION.—The annual general business meeting is to be held at Liverpool on July 21st at 8 p.m.

Faraday House Old Students' Association.—The fourth annual dinner of this Association was held at the Queen's Hotel, Leicester Square, on Thursday, June 18th, with the President of the Association, Mr. Gerald W. Partridge, engineer-in-chief of the London Electric Supply Corporation, in the chair. The company included Mr. W. M. Mordey (President of the Institution of Electrical Engineers), Mr. Robert Hammond, Major O'Meara, Mr. Hugo Hirst and Mr. Philip Dawson who proposed the toast of the evening—"Faraday House and its Old Students." As is usual at these gatherings, beyond this toast, there were no other speeches, the dinner being followed by an excellent smoking concert.

Electrical Engineer's Slander Action.—At Gloucester Assizes on Tuesday, Mr. Walter James Bache, borough electrical engineer, Cheltenham, sued Thomas Rees Jones, draper, and a member of the Cheltenham Town Council, for alleged slander. The alleged slander was contained in a public speech made by the defendant, which plaintiff contended bore the construction that he had cut down wages at the electricity works in order to effect economies, and thereby induce the Town Council to give him an increase of salary. The defence was a denial that the words used bore the construction alleged. The jury found for the defendant, saying they considered the plaintiff had no ground for action. Judgment was accordingly entered for the defendant, with costs. We shall refer to this matter in our next issue.

New Electrical Laboratory at Oxford.—The Draper's Company have granted a sum of £22,000 for the building and all the accessories of an electrical laboratory, which is to be presented by them to the Oxford University, and have instructed Mr. T. G. Jackson, the company's architect, to carry out the work.

Appointments Vacant.—Assistant teacher (motor engineering) for the Engineering Department at Woolwich Polytechnic (£150-£170); also a second assistant teacher (electrical technology), (£180).

Erratum.—In the review on page 1087 of this issue, col. 1, line 12, for "non-pulsating current" read "non-pulsating direct current."

OUR PERSONAL COLUMN.

The Editors invite electrical engineers, whether connected with the technical or the commercial side of the profession and industry, also electric tramway and railway officials, to keep readers of the ELECTRICAL REVIEW *posted as to their movements.*

Central Station Officials.—The staff of the Torquay Electricity Works has presented a kettle and stand with lamp to MR. C. D. H. JACKSON on his marriage.

MR. E. C. BARTON, managing director of the Brisbane City Electric Light Co. (of which he was the founder) is in England on a visit for a month. His company is shortly going to carry out extensions, the whole of the capital for which has been raised without difficulty in Brisbane, thus showing that Queensland is not wholly dependent upon this country for capital.

On June 10th, MR. EDGAR HOLLAS, charge engineer, Halifax Corporation Electricity Works, was the recipient of a marble timepiece from the staff and employés of the department, on the occasion of his marriage. Mr. Rogerson, the borough electrical engineer, made the presentation.

On Tuesday afternoon, June 23rd, MR. F. W. PURSE, who is leaving the Warrington Electricity and Tramways Departments to take up the post of chief electrical engineer to the Watford U.D.C., was presented by Mr. F. V. A. Mathias, chief engineer, on behalf of the staff and employés, with a silver cigarette box and cigarette case.

Tramway Officials.—MR. J. R. GROVES, the manager of the Peterborough Tramways, has been appointed manager of the Worcester Electric Traction Co.'s undertaking.

EX-BAILIE JAMES MACFARLANE and BAILIE RUSSELL, the convener and sub-convener of the Glasgow Corporation Tramways, have, along with the general manager (MR. JAS. DALRYMPLE), been appointed to represent the Glasgow T.C. at the forthcoming International Tramways Conference at Munich.

General.—The Albert Medal of the Royal Society of Arts for the present year has been awarded to SIR JAMES DEWAR, F.R.S., "For his investigations into the liquefaction of gases and the properties of matter at low temperatures, investigations which have resulted in the production of the lowest temperatures yet reached, the use of vacuum vessels for thermal isolation, and the application of cooled charcoal to the separation of gaseous mixtures and to the production of high vacua."

The Council of the Royal Society have awarded a Mackinnon studentship in physics for 1908 to MR. J. A CROWTHER, of St. John's College, Cambridge, for an investigation of the passage through matter of the β-rays from radio-active substances.

PROF. SIR WILLIAM RAMSAY, K.C.B., F.R.S., has been nominated by the Queen of Holland as a member of the Dutch Academy of Amsterdam, in succession to the late Lord Kelvin.

We regret to hear that MR. HORACE BOOT, consulting engineer, is seriously indisposed; he hopes to return to work in the course of a week or two.

On 17th inst. LORD RAYLEIGH was formally installed as Chancellor of Cambridge University in succession to the late Duke of Devonshire. He then conferred honorary degrees upon Sir William Crookes and a number of others.

MR. JAMES RUDDICK, late of Parsons & Co., Newcastle, and the Underground Electric Railway Co., of London, has recently been appointed chief of the Shawinigan Water and Power Co.'s generating station at Shawinigan Falls. MR. ALEX. MCKEE, who was for two years on the staff of the South Lancashire tramways, has been appointed chief assistant.

It is probable that Dr. HALL-EDWARDS, the radiographer to the General Hospital, Birmingham, who has already had his left arm amputated, will have to lose all or part of his right hand as well, in consequence of the hold which dermatitis has secured upon that member.

The Government authorities have purchased the lease of 5, Great George Street, S.W., in accordance with the scheme of the Public Offices Sites (Extension) Bill. Messrs. Bramwell & Harris are removing their offices to No. 11, Great George Street by the end of this month.

MR. I. PROBERT, of the Postal Telegraph Department, General Post Office, has been appointed superintending engineer of the electric lighting section of the department in London. Mr. Probert has long been engaged in the work of this section, and his promotion to a higher position has been well earned.

INSTITUTION OF ELECTRICAL ENGINEERS' "HOME."

AN interesting and important communication came to hand from the Secretary of the I.E.E. on Wednesday last, relating to the proposed acquisition of a building to form the headquarters of the Institution. The premises in question is known as the Medical Examination Hall, and is situated on the Victoria Embankment, between the Savoy Hotel and Waterloo Bridge, facing one of the Embankment gardens; it is midway between the Charing Cross and Temple Stations on the Underground Railway, close to the new Strand Station of the Piccadilly Tube, and the junction of the London County Council tramways to North and South London on the Embankment, and it is within ten minutes' walk of Waterloo, St. Paul's and Charing Cross Stations. The situation is, in fact, all that could be desired on the score of accessibility and environment, while the building itself, of which, by the courtesy of the Secretary, we are enabled to reproduce a photograph, appears to be admirably adapted to the purpose of a home for the hitherto nomadic Institution.

The building covers an area of over 20,000 sq. ft., nearly square in plan, and comprises three floors and a basement; there is a lecture theatre, "rather small, but the Council considers that it can be increased and improved without very serious expense," and a large number of handsome, well-lighted and lofty rooms, the total floor space (exclusive of corridors, &c.) amounting to more than 40,000 sq. ft.

The owners of the property are the two Royal Colleges of Physicians and Surgeons, who hold it from the Duchy of Lancaster on a 99-years' lease dating from 1885, the unexpired portion being therefore 76 years; the Council proposes to purchase this lease for £50,000, plus the ground rent of £2,201 per annum. A special general meeting of the Members, Associate Members, and Associates of the Institution has been convened, to be held on Tuesday next at 5.30 p.m., to consider the proposed purchase, and, if the decision is favourable, to authorise the realisation of investments and the sale of the site in Tothill Street owned by the Institution for the purpose. The meeting will be held in the lecture theatre of the Hall, and the principal lower rooms will be open to inspection from 5 o'clock on the day

Proposed Headquarters of the Institution of Electrical Engineers.

of the meeting. We understand that the negotiations are fairly complete, though they will not be binding on either party until the contract of purchase has been signed; and this cannot be done until after the meeting.

The Tothill Street site purchased by the Institution in March, 1904, cost £16,500, and since that date the Building Fund has been increased to £21,376—a long way short of the £50,000 required to purchase the Medical Hall, though the probable appreciation in value of the former property since its purchase will afford some little assistance. The total annual revenue of the Institution is at present £11,710, and the excess of income over expenditure is £3,678, while the net assets amount in all to £45,313.

The total annual outlay on the new premises for ground rent, loss of interest on £30,000, and sinking-fund to replace the capital in 76 years, will amount to not far short of £5,000 a year; obviously, therefore, it will be necessary to let a large portion of the building for offices, &c., to provide for this outlay, and doubtless this is the intention of the Council.

Probably, as an investment, the proposed purchase is by no means a bad bargain, all things considered; but there is another side to the question, which is set forth in the following communication from a provincial correspondent:—

"It is necessary to point out one or two facts with regard to the Institution finances, which seriously affect this proposition from the point of view of that large mass of Members, Associate Members, and Associates of the Institution who do not reside in London, and who will therefore only have a very slight participation in such benefits as may be derived from this new building. On reference to the accounts of the Institution, it will be seen that the last balance put to general fund, that is to say, the surplus of income over expenditure, is £3,678. There is now a sum of £13,900 in the general fund, and, assuming that the present rate of income and expenditure continues, this may reasonably be expected to increase at an approximate rate of £3,000 per annum. At the present time the expenditure of the parent section of the Institution in London, including rent, insurance, lighting, firing, advance proofs, refreshments, reporting, the conversazione, and depreciation on library and furniture, &c., amounts to something over £1,200. Of this figure the amount spent on rent, insurance, lighting and firing of the Institution's present premises is £670. Now there are six local sections, which presumably cater for the current needs of the members of the Institution in various parts of Great Britain. The total amount spent on the whole of these sections for last year was only £582. These figures show that already the Institution is spending more than twice as much on the upkeep of its London premises as on the whole of the provincial sections, and it would be interesting to know the relative advantages of a London club and properly equipped provincial centres. Should this new proposition, which can legitimately be described as a surprise, be put into effect at a short-notice meeting, at which the preponderance of votes will be those of men residing within a short radius of London, whose interests will be almost entirely in sympathy with the London

section only, the bulk of the income of the Institution will be spent on increased and, it may be argued, rather unnecessary glorification in London, whilst probably wiping away any chance of developing the Local Sections to a point of increased usefulness.

That such improvement is necessary has been evidenced by the repeated inquiries in the past as to whether more suitable building accommodation and other facilities could not be provided for provincial members, and, taking into account the proportion of metropolitan as compared with provincial members, a subsidy of, say, £200 a year allocated to each provincial centre for the provision of suitable rooms, including a small library and other technical advantages, would not be excessive. It would at any rate be preferable to spend the money in this way rather than to abstract the large capital of £50,000 from paying securities and invest it in architectural vain-glory for the almost sole benefit of a fraction of the electrical fraternity."

Another question is whether the arrangement which we have advocated so many years—an engineering institution to house all the leading societies—could not now be brought about, seeing that the Institution of Civil Engineers will also be "moving" very soon. But the extremely limited time allowed for inquiry and consideration precludes further comment at this moment. We hope that the members will discuss this important matter fully, and will not hesitate to adjourn their final decision if they think it advisable. It is to be regretted that on the day appointed for the meeting, many members of the Institution will be at Nottingham, at the I.M.E.A. Convention, and therefore cannot be present.

NEW COMPANIES REGISTERED.

Electro-Mechanical Brake Co., Ltd. (98,276).—This company was registered on June 6th, with a capital of £10,000 in £1 shares, to acquire the benefit of certain existing inventions referred to in an agreement with J. B. Hamilton, A. W. Maley, G. Conaty and G. Law, jun., and to carry on the business of brake makers, electrical and mechanical engineers, manufacturers of and dealers in tramway carriages, trucks, motors, accumulators and dynamos, &c. The subscribers are:—J. B. Hamilton, Leeds, general manager City Tramways, 600 shares; A. W. Maley, Eagle Works, West Bromwich, engineer, 150 shares; G. Conaty, 109, Colmore Row, Birmingham, engineer, 800 shares; G. Law, jun., Landoak House, Kidderminster, contractor, 1,300 shares; J. Hamblet, Yew Tree House, Great Barr, Staff., ironfounder, 1 share; H. Denison, 10, East Parade, Leeds, solicitor, 1 share; D. H. Wilmer, 10, East Parade, Leeds, clerk, 1 share. No initial public issue. The number of directors is not to be less than three or more than seven; the first are J. B. Hamilton, A. W. Maley, G. Conaty, G. Law, jun., and J. Hamblet; qualification, £250; remuneration (excepting managing director), £100 per annum, divisible. Registered office, Eagle Works, Moor Street, West Bromwich.

Electrocab Development Co., Ltd. (98,352).—This company was registered on June 13th, with a capital of £100 in £1 shares, to carry on the business of electrical, mechanical and general engineers, manufacturers of and dealers in electro-cabs, electro-omnibuses and other electric vehicles, tires, wheels, motor-cars, motor-omnibuses, bicycles, carriages and vehicles of all kinds, &c. The subscribers (with one share each) are:—J. Williams, 56-6, Chancery Lane, W.C., clerk; R. James, 57-8, Chancery Lane, W.C., clerk; D. Cony, 59-60, Chancery Lane, W.C., clerk; C. Dew, 65, Chancery Lane, W.C., clerk; A. Budd, 66, Chancery Lane, W.C., clerk; R. H. Hammant, 63, Chancery Lane, W.C., clerk; J. Booty, 66, Chancery Lane, W.C., clerk. No initial public issue. Registered without articles of association.

London Electrocab Co., Ltd. (98,355).—This company was registered on June 13th, with a capital of £100 in £1 shares. Other particulars as in Electrocab Development Co., Ltd. (q.v.).

CITY NOTES.

The B.E.T. Report.

We sympathise with Mr. Garcke in the comparative adversity that appears to have fallen upon the affairs of the British Electric Traction Co., which is one of his principal prides. There have been many vicissitudes in the company and its offspring, both in the *personnel* of staff and in administrative policy. We, however, are not persuaded that many of the permutations have been for the best; possibly they may be due more or less to the whimsical foibles of some who are obsessed by an elusive sense of their nebulous importance.

The report and accounts do not make altogether pleasant reading. After providing for the interest on the debenture stock amounting to £97,484, the net profit for the financial year ended March 31st last, is £105,709, which, with £13,115 brought forward from the previous year, makes a disposable balance of £118,824. The full dividend on the preference shares for the six months ended September 30th, 1907, which it is recommended shall be paid, absorbs £48,431, general reserve receives an addition of £35,000, and £35,393 is carried forward to the next account.

This result, however, is only rendered possible of achievement by taking credit for £49,954 of the paper profit on the heavily watered Bombay undertaking, which for the moment may be regarded as undistributed to the extent of the carry forward.

Of the total income of £250,539 for the period appearing in the profit and loss account, dividends on shares, interest on debentures, interest on Consols, and net profit on the working of Barrow, Brighton, and Mumbles undertakings, account for 63·8 per cent.; interest on loans, and deposits, &c., 5·8 per cent.; profit on Bombay undertaking, 19·9 per cent.; profit on sale of investments, 4·3 per cent.; and profit on contracts, &c., 6·2 per cent.; the net profit on the working of Barrow, Brighton, and Mumbles undertakings yielding 4·4 per cent. on the capital expenditure thereon.

"Reserves" against specific assets total £41,116, £32,616 being against debtors, £2,000 against buildings, and £6,500 against stock, £17,500 of which is, perhaps, the most conspicuous feature of the debits against profit and loss account under review. Management and general expenses, which cost £24,186, should have been exhibited in greater detail, having regard *inter alia* to the fact that only £2,544 was debited to the company by the newly incorporated British Electrical Federation, Ltd., for six months' services.

Although probably more an academic matter, so long as the assets and liabilities are shown and described in such a manner that they are intelligible to the investor, a balance-sheet is merely a statement, and not an account, and the use, therefore, of the terms Dr. and Cr., if not incorrect, are, at any rate, superfluous. The "investments and undertakings" stand at something over five millions book value, of which a little over three and a quarter millions yielded an average return of 4·7 per cent., whilst over one and a half millions did not yield any return at all, which does not quite harmonise with the "strong financial position of the company," and so on, of which we are reminded on page 15 of the report. The amounts due to the company still reach a large aggregate—over half a million—including some £4,000 from the British Electrical Federation, Ltd. No indication of the nature of the debts appears in schedule 6. £17,528 represents "balance of expenditure on Acts of Parliament, &c.," which is capable of some detailed explanation, and no doubt, of further treatment. One or other of the phrases "balance of" and "written down to" seems tautological. The cash at bankers we shall notice presently.

The liabilities do not include any item of striking note. The reserve, which stands at £567,420, is composed of £577,898 premiums on share and debenture issues, and £20,000 from revenue account, less £30,478 applied to net discounts on debenture stocks and undertakings written off.

It will thus be seen that a very small percentage of the reserve has been created out of revenue account. The premiums referred to are perhaps not entirely inconsequential of the inordinate dividends for an undertaking of the kind, which were paid during the periods of accretions to the reserve from that source.

The schedules accompanying the accounts are admirable. In that, however, on page 28 of amounts set aside by associated companies to depreciation and reserve funds, including balances of profit carried forward, the profit balances carried forward should have been shown separately. In any case the amounts appropriated to depreciation and reserve are relatively trifling.

The amount of cash at bankers at the date of the accounts, viz., £53,249, is reducible to a negative factor contrasted with the positive liabilities in respect of the preference dividend, debenture interest accrued, and so on.

Looking at the accounts broadly, we cannot but regard the showing as exceedingly indifferent, if not grave, when we consider that it requires per annum £97,484 for the service of the debenture stock, and £96,862 for that of the preference capital against a potentially improving income of £159,736, from which must be deducted £20,000 to £25,000 for management and general expenses. The remainder of the income is probably for the most part incidental or extraneous, and therefore naturally of a spasmodic nature.

If we even assume an all-round income on the book value of its investments of, say, 4 per cent., the income would be considerably more than extinguished by the debenture interest, preference dividend and management charges, which impels us to the conclusion that the only hope of the ordinary and preference shareholders lies in "promotion profits," in a continuity of profitable realisations of its principal assets and reinvestments of a more lucrative character, all of which we would fain hope is not beyond the realms of potentiality. Many of the investments, however, we should not care to purchase.

J. G. White & Co., Ltd.

The directors' report to February 29th, 1908, states that the progress of the business has continued to be satisfactory, and the year's trading shows a net profit of £36,162. Profit has only been taken into the accounts on work actually completed at the date of the balance-sheet. Included in the completed works at that date was the tramways system for the town of Luton, which is now being operated successfully by the company under a leasing agreement. The company is now actively carrying out work in Buenos Ayres, Monte Video, Para (Brazil), Dumbarton, and at other places. Since the date of the balance-sheet contracts have been secured for an electrical supply installation at Arbroath, for the supervision of tramway works in Santos (Brazil), and for other tramway construction. Various negotiations are in progress which, it is hoped, will lead to additional business of considerable magnitude, both at home and abroad, and the directors look upon the company's position, in view of the severe competition and general financial stringency which has existed in businesses of this nature, as being satisfactory. The Building Co., in which this company has an interest, has also shown satisfactory progress. The investments are shown in the balance-sheet at the usual conservative valuation, which should provide for a profit in realisation. Since the date of the balance-sheet securities valued at £24,752 have been sold at a profit, which will come into the current year's accounts, leaving £119,496 as the valuation of the remaining securities. The average yield in interest and dividends during the year was equal to a percentage of 6¼ on the amount of the valuation. The balance to the credit of this account, after bringing in £18,312 from the previous account, deducting the interim dividend paid on the preference shares at January 1st, 1908, and making provision for percentages due to directors and staff, is £47,749. The directors recommend a dividend of 6 per cent. per annum on the cumulative preferred shares for the half-year to February 29th, 1908, requiring £4,500, a dividend of 6 per cent. per annum on the ordinary shares for the year to the same date, requiring £3,000, and the payment of a bonus of 2 per cent. on the full amount of the preferred and ordinary share capital (making 8 per cent. for the year), absorbing £4,000, placing to reserve £20,000 and carrying forward to next year's accounts £16,249.

Buenos Ayres Grand National Tramways Co., Ltd.

The directors' report for the year ending March 31st, 1908, states that the gross receipts of the lines operated by the Buenos Ayres Grand National Tramways Co., Ltd. (consisting of the lines of this company and those of the Buenos Ayres New Tramways Co., Ltd.), have amounted to £380,969, as compared with £321,256. The working expenses were £242,118, as compared with £220,389, and the net receipts £138,851, as compared with £100,867. The Grand National Co.'s share of the above net receipts under the agreement has amounted to £91,447, as compared with £68,406 for the previous year. After payment of London administration expenses, interest on debentures, &c., there remained a balance of £37,841, from which the sum of £3,502 has been transferred to debenture reserve funds and £3,726 to income bondholders' interest account, and there has been paid on February 15th, 1908, £11,250, being the interim dividend of 2½ per cent. on the 5 per cent. cumulative preference shares, leaving £19,363, which the directors recommend should be appropriated as to £11,250 to the payment of a further 2½ per cent., payable on August 1st, 1908, on the preference shares (making 5 per cent. for the year to March 31st, 1908), £3,293 to contingency fund (bringing that fund up to £7,000), the balance, £4,819, being carried forward. Since the last ordinary general meeting of the company continued progress has been made with the work of converting for electric operation the joint system of this company and of the B. A. New Tramways Co., and of constructing further lines authorised by concessions from the Municipality of Buenos Ayres. At March 31st, 1908, there had been converted a total length of 85⅔ miles, of which about 81 miles were being operated.

Bruce Peebles & Co., Ltd. (in Liquidation).

On July 10th, at Edinburgh, meetings of debenture-holders, creditors, and both classes of shareholders, will be held to consider and approve a scheme of arrangement, dated June 15th. From the circular describing the said scheme we gather that a new company, with the same name, is to be incorporated with a nominal capital of £250,000 in £1 shares. It will acquire all or any assets, and undertake liabilities of the old company, and will have as its first directors the following:—Charles H. McEuen, of Callender's Cable and Construction Co., Ltd.; M. B. Mountain, of Mountain and Gibson, Ltd.; Alex. Mackenzie, of Mackenzie & Moncur; and F. E. Andrews, of the Brush Co., along with one director nominated by the liquidators, and one or two (as determined by the court) nominated by the debenture-holders of the old company. The 5 per cent. debentures (£75,000) will be cancelled, and in place thereof the holders will receive 5 per cent. mortgage debentures in the new company equal to the amount of principal moneys due on the surrendered debentures. The ordinary creditors other than the debenture-holders will receive in the form of a 6 per cent. unsecured debenture, ⅘ths of the sum for which they ranked in the liquidation the remaining ⅘ths being paid in fully-paid shares of the new company. Creditors for £10 and under can have a cash dividend of 5s. in the £1 if they exercise that option within a month.

Each preference shareholder will receive for each £5 share three £1 shares in the new company, credited as 13s. 4d. paid up, and every ordinary shareholder one share of £1 credited as 10s. paid up for every ordinary share of £5 held in the old company. Applications to these effects will have to be accompanied by 1s. 8d. per share to account of the liability on the shares applied for, the balance being payable in equal instalments two or three months from allotment.

Until the assets have been made over the liquidators propose to keep the old company's business going, so as to hand it over as a going concern.

The Committee in a circular that they have issued say:—"The gentlemen nominated to be directors as representatives of the creditors are men of experience in the electrical industry, and consequently the affairs of the new company should be administered on sound business lines. Considerable economies have already been effected by the joint liquidators during their period of office. The manufactures of the company have a large sale in this country and abroad, and there is every reason to believe that the business should, in a comparatively short time, regain its place in the electrical industry and become a prosperous concern."

Globe Telegraph and Trust Co., Ltd.

The report for the year ended May 31st, 1908, states that the net revenue, after deduction of expenses, amounts to £210,295, and makes, with the balance of £26,566 brought forward, a total of £236,860. From this amount there has been distributed the sum of £131 770 in interim dividends, leaving an available balance of £105,091. The directors now recommend the payment of the following final dividends, viz., 3s. per share, less income-tax, on the preference shares, making with previous distributions a total dividend for the year on those shares at the rate of 6 per cent. per annum, less income-tax; and 5s. 9d. per share net on the ordinary shares, making, with previous distributions, a dividend on these shares at the rate of 5⅞ per cent. net for the year. These dividends will absorb the sum of £77,885 and leave a balance of £27,206 to be carried forward.

The Aluminium Corporation, Ltd.

The directors' report recently issued contains balance-sheet covering the transactions of the company since its incorporation on April 10th, 1907, up to March 31st, 1908, a period of nearly a year. Good progress has been made with the Dolgarrog works, for the construction of which the company was primarily formed. The buildings of the power house and furnace house are completed; much of the plant is already installed, and as soon as the pipe-line is finished the production of aluminium at these works will commence. The pipe-line is expected to be ready for service in August next, and the existing natural storage afforded by the company's water rights should give ample water-power during the earlier stages of production in the summer until the works come into full operation. During the autumn and winter months there is sufficient rainfall to permit of the works being operated to their full capacity, while the construction of the storage dam is being completed. This dam is designed to conserve sufficient water to keep the works in continuous operation during summer months. Since the date of the prospectus, it has been decided not to erect a sub-station near the works of the North Wales Power Co., but to put such sub-station at Dolgarrog, thus concentrating all the works under the same roof. While this has involved the construction of a transmission line, the materials for which were furnished by the North Wales Power and Traction Co., Ltd., the additional cost will be amply justified by the resulting convenience and economy in operating. The Wallsend works are now completed, and partially in operation. Aluminium of high quality is being produced. In conjunction with the furnace house, carbon works have been erected on an adjoining site, capable of manufacturing carbon electrodes to supply the whole of the company's requirements at Dolgarrog as well as at Wallsend. The leases of valuable Bauxite properties in the South of France have been acquired, so that the company is now mining its own bauxite for the production of alumina, instead of purchasing the latter in the open market, as was at first contemplated.

In conjunction with one of the largest chemical companies in Great Britain, the Corporation is forming the Bauxite Refining Co., Ltd., and will hold three-fourths of its shares. The Refining Co. will purchase bauxite from the Corporation at a price more than sufficient to cover the cost of production, and will supply alumina to the Corporation at a fixed rate of profit. The Refining Co.'s works will be at Hebburn-on-Tyne, with every advantage as regards fuel, material, and transport. Equipped, as they will be, with all modern improvements, the new company should produce alumina more economically than any other company of the kind in existence. Thus, the Corporation will not only receive three-fourths of the profits realised by manufacturing alumina, but will also secure the most important of its materials at a much lower price than it could be obtained in the open market. In addition to the demand for aluminium in ingots, there is a very large demand for sheets, and the directors have accordingly concluded arrangements with an important company to erect and equip rolling mills, which will supply the Corporation's requirements for aluminium in sheets at

a fixed and reasonable rate of profit. The developments referred to have necessitated further financial provision, and £150,000 first mortgage debentures have been created. Arrangements are being made for the issue of £100,000 of these debentures, and shareholders will be given an opportunity of applying for them. They will give a first charge over the whole undertaking, and the holders will be entitled to exchange them at their face value for 7 per cent. participating preference shares at any time before December 31st, 1913, when the debentures are redeemable.

The uses of aluminium are not yet generally recognised, but the recent reduction in price must inevitably call attention to its potentalities in competition with other metals. The price has, hitherto, been chiefly regulated by that of copper, and has generally been twice as high, so that while, for a given weight, the volume of aluminium is 3½ times, and its tensile strength nearly 1½ times, that of copper, the relative advantage of aluminium has been in respect of lightness rather than strength. With aluminium at £80, and copper at £60, the former metal possesses both advantages in a marked degree. Its conductivity is so high that, in conjunction with the factors of price, weight and strength, it gives aluminium a great superiority over copper for electrical transmission lines. These facts cannot fail to bring aluminium into large demand. While the lower price of aluminium must reduce the rate of gross profit which can be earned, it should at the same time so widen the scope of its utility as to make it a staple commodity. It is anticipated that even if the price should remain as low as at present, the increased capacity of the Corporation's works, and the economies resulting from recent arrangements referred to above, will compensate to a large extent for the fall in price which has occurred.

The first annual general meeting of this company was held on Wednesday at Winchester House, Old Broad Street, Sir James Sievewright, K.C.M.G., in the chair.

In proposing the adoption of the above report, the Chairman said that, taking the credit side of the balance-sheet first, their freehold and leasehold property and water rights stood at £86,140, which included the £55,000 which they paid for the freehold in North Wales as well as their leasehold properties which were now in operation at Wallsend. The construction and equipment of the works at Dolgarrog and Wallsend up to date totalled £100,455. The contribution to the cost of the Wallsend electrical sub-station and engineering fees amounted to £6,200. That was part of the sum that they paid to the Newcastle Electric Supply Co. for machinery which had been installed there. They had the option at the end of their agreement with that company to take over the machinery at the actual cost price, less depreciation. The expenditure on the transmission line amounted to £4,452. That was a line erected in North Wales from the works of the North Wales Power Co. to their own works at Dolgarrog, because it was considered desirable on every ground that in place of having two stations in North Wales they should concentrate all their power on one spot. That they had done, and the administrative costs which would thereby be saved would be far in excess of the outlay that had been incurred on that transmission line. In the month of March the first furnace was stacked at Newcastle, and they had been gradually adding to the furnaces there. The aluminium which was produced was of a very high quality indeed. In no case had it fallen under 99 per cent. of the pure metal. They also had one of their carbon furnaces in full operation at the present time, and were turning out carbon there. Eventually they would have three carbon furnaces. In North Wales the works had been prosecuted with great vigour. They had no reason at present to fear that their water power would not not be in operation shortly, and at the beginning of August they hoped to be turning out aluminium at Dolgarrog up to the extent of about 1,500 tons per annum. The works at Newcastle-on-Tyne and the works at North Wales had, up to the present time, been carried out well within the estimates which were submitted, and no additional money for that particular purpose would be required. They would recollect that when the company was brought out, aluminium was standing at a very high figure. It was selling at about £180 or £200 per ton, but since then it had dropped in price, and to-day it was in the neighbourhood of about £80 per ton. Still, they viewed the situation with perfect equanimity, and he had no hesitation in saying, after the experience which they had had with their own works in North Wales, that even at £80 a ton they would be able to make good profits and pay substantial dividends. That was his firm conviction at the present time. At present they were buying their alumina in the open market. The raw materials required for the production of aluminium were cryolite and alumina. At the high prices ruling for aluminium a short time ago they could afford to pay a good price for their alumina, but if they were to enter into the market they had got to save every single sixpence they possibly could, and attacking a monopoly, as they were practically doing, they had got to expect very severe competition. They were quite prepared for that, and to meet it had decided to put up their own aluminium works. As soon as that decision was come to they visited the Var district in France, where the best quality of bauxite, which was the basis of aluminia, was to be found. They carried out prospecting and exploiting operations, and had been very successful; only that morning they had received confirmation of a telegram which reached him on the previous Sunday to the effect that they had secured a lease from the French Government of an extremely valuable bauxite property which he himself had examined. The bauxite there was of excellent quality, running to 60 per cent. of aluminia, and 1 per cent. of silicia. They had had it tested at their works at Newcastle, and were perfectly satisfied as to its quality. The Northern of France Railway ran right through the property, and they had a choice of either Nice or Marseilles as ports. They had made arrangements with one of the largest chemical companies in Great Britain, whose works were at Hebburn, and quite close to their Wallsend works, for the formation of a sub-company to be called the Bauxite Refining Co., Ltd. The Aluminium Corporation would hold three-fourths of the capital of the new company, and the remaining portion would be held by the chemical company, to which he had referred. That company would supply them with their caustic soda at market prices at their doors, and coal, the other essential for the reduction of bauxite to aluminium, was right on the spot. The chemical company had leased to them on very moderate terms, 4 or 5 acres of their land. It would, therefore, be seen that they had caustic soda at their doors, they had cheap coal, and they had their own bauxite, and he was sure they would be able to produce the finished article at a price which would compare favourably with producers in any part of the world. At present they turned out their aluminium in ingots or notched bars, but numerous inquiries were being made for sheet aluminium, and there could be no doubt that there was an enormous future for the metal in connection with wires for electricity. They had made arrangements with one of the leading companies in Great Britain for the rolling of their sheets of aluminium and for the drawing of their wires—an arrangement which he was satisfied would work to the advantage of both parties. As to the future, when they formed the company they called for £300,000, but on account of the miserable state of the money market, only 250,000 of their preference shares were allotted. In order, therefore, to complete the whole of their works, the producing power of which would be double what was originally contemplated, they would require further money, and there would shortly be a debenture issue. They had taken authority to create £150,000 of 5 per cent. debentures, and they would issue £100,000 of them before long. After consulting those best qualified to give them sound advice on the matter, they would probably make it a 15-years' debenture with a sinking fund commencing in the year 1910 for the purpose of redemption either by annual drawings or by purchase in the open market.

Mr. Edward Manville, in seconding the motion, said that, speaking with a knowledge of electrical matters, he was convinced that aluminium had been very much hampered hitherto because the manufacture had been under the control of a few people, with the consequence that there had been no stability in the price. That fact had militated against its use in electrical work, where it might enter into competition with copper very favourably. He thought the fact of a corporation like theirs working outside the combine would produce that amount of confidence which would induce the use of aluminium by those who had not hitherto used it, but who could very well have used it if it had not been for the question of price. Indeed in regard to many electrical purposes aluminium had properties which made it superior to copper, where the relative prices were somewhat the same. It was particularly useful for long transmission lines used for conveying electrical energy over long distances. At the present moment it was being largely used for that purpose, and in many countries it was also being used for telegraphic purposes on account of its lightness in weight as compared to copper.

The report was adopted.

British Electric Traction Co., Ltd.

The directors' report for the year ended March 31st, 1908, gives as an appendix, a schedule concerning all the associated companies to enable shareholders to form a correct view of the position of the company. The capital account remains the same as a year ago—viz., £4,949,969. The amount standing at the credit of reserve account is £567,420. No good purpose will be served at present by utilising the reserve to write down the assets, though this question has been considered. In addition reserves have been made out of profits against loss or depreciation of specific assets, and of these reserves a balance of £41,117 is unappropriated. The foregoing, however, are not the only reserves, as the various associated companies have created depreciation and reserve funds of their own, which at December, 1907, were £902,728. The associated companies have recently, on the recommendation of this company, adopted resolutions with a view to increase their provision against depreciation, and also to define more clearly the purposes of their reserve funds. They will make minimum provisions before payment of dividends for (1) Permanent way renewals, (2) Redemption of capital, and (3) General depreciation purposes. Some of the companies have done this in respect of the past year's accounts, and endeavours will be made to give full effect to them in future years. The liabilities of the company, which at March, 1907, stood at £278,550, have been reduced at March, 1908, to £59,193. Of the latter amount £46,623 was in respect of debenture interest accrued at March 31st, 1908, since paid. The liabilities have thus been reduced during the year by £219,357. The smallness of the amount considered in relation to the magnitude of the assets points to the company being in a strong financial position. The chief item in the balance-sheet is investments, and these stand as follows:—

	Par value.	Stand in books at
Consols	£200,000	£196,374
Debentures in companies	995,251	978,559
Shares	4,485,590	4,289,368
		£4,964,331
Capital expended at Barrow, Brighton and Mumbles		143,372
		£5,007,703

Investments standing at £3,275,178 earned an average return of 4·7 per cent. during the year. Others standing at £1,589,152 earned no revenue during the year. This figure is £103,483 less than in the previous year. The investments are less by £103,669 as securities of £243,776 have been sold at a profit of £10,882; securities standing at £140,107 have been added. The amount of sundry debtors and debit balances has been reduced from £631,632 to £545,801. The item expenditure on Acts of Parliament, surveys, &c., for schemes which may not be proceeded with is being written down annually by 20 per cent. It now stands at £17,529. Stock stands at £10,341, and it represents cars on hire to associated undertakings, electrical equipments, paving setts, and general stores. It is being gradually reduced by sales, and provision is made annually for any depreciation in value. Land and buildings stand at £19,931, an increase of £8,067 due to expenditure on the new office building, which is to be transferred to the British Electrical Federation. Furniture standing at £3,099 will also be so transferred. Goodwill stands at £1,000, and is the balance of a larger amount. The profit and loss account shows as follows:—

Gross profits for the year	£250,539
Expenses, including £73,682 interest on 5 % debenture stock, and £23,802 interest on 4½ % ditto	£144,829
Leaving	£105,710

Adding £13,115 brought forward makes £118,825 to be dealt with.

The gross profits include £49,954 profits on the Bombay undertaking, and £10,882 net profit on sale of investments. The expenses include £17,500 reserved to meet depreciation of undertakings worked by the company (apart from investments), buildings, doubtful debts, and expenditure on undertakings not proceeded with. The report continues:—

"The directors have given the question of the distribution of the balance of profit their earnest consideration. They recognise the desirability of paying the full dividend on the preference shares. They feel, however, that this question is at present governed by the importance of making further provision for depreciation, and by the advisability of keeping ample funds in hand to assist the company to enter upon new enterprises when opportunity offers. Every effort is being made to increase the income of the existing investments; meanwhile, the other available source of increased profits is from the initiation and development of new undertakings. Some further comments on the general position and prospects of the company—which presents several favourable aspects—are made in the concluding paragraphs of this report. But on the question of the dividend, the directors are unanimously of opinion that, in advising the preference shareholders to agree to a postponement of a part of their dividend, they are recommending a course which will materially strengthen the position of the company, and which, by improving the prospects of increased profits, offers future compensation to both classes of shareholders for their present sacrifices. The directors therefore recommend that the full dividend on the preference shares at the rate of 6 per cent. per annum, be paid for the six months ended September 30th, 1907, being at the rate of 3 per cent. for the financial year." This will absorb £48,431. Of this there has already been paid the dividend up to August 15th, 1907, and it is proposed that the balance of 1s. 5½d. per share be paid forthwith. They further recommend that there be added to general reserve (increasing it to £602,420) £35,000, carrying forward £35,394. The directors consider that a dividend on the preference shares, at the rate of 3 per cent., may be regarded as a minimum distribution for the current financial year and they propose that this shall be paid in two equal instalments on August 15th and February 15th next, and they hope that increased profits will in the near future enable the arrears of preference dividend to be paid off. In comparing the amounts received by way of dividends and interest on investments it must be remembered that the investments were £103,669 less as stated above. The traffic receipts upon most of the tramways and light railways in which the company is interested were adversely affected by wet and cold weather.

The number of passengers carried last year was slightly less than in 1906, notwithstanding the increase in the number of miles worked. This reduction was due partly to the unfavourable weather and partly to the fact that several miles of tramways in the City of Birmingham reverted to the Corporation at the end of 1906, and that the new lines opened in various places do not as yet equal in density of traffic the routes which have been lost. The traffic on the lines which have been in operation for some time is, however, on the whole developing satisfactorily.

In the last report it was pointed out that between 1901 and 1906 the average fare per passenger had been reduced from 1·36d. to 1·22d., as a result of the general demand for lower fares and increased facilities, and that the difference of ·16d. per passenger represented a sum of £201,228 on the number of passengers carried in 1906 by the associated companies.

Efforts were made during the past year to improve the position of the undertakings by increasing the fares, by shortening the fare stages, and by eliminating unremunerative services.

The increases of fares were not made till the second half of the year, and it will necessarily take some time before the full effects of these changes can be ascertained. Meanwhile, the directors regret that owing to the causes above referred to, the average fare for the past year has fallen to 1·21d. per passenger.

"The general charges and expenses of administration appear in the accounts in a form which does not compare easily with previous years. This is due to the expenses for the last nine months of the year having been discharged on a co-operative basis by the British Electrical Federation, but the directors are able to report a further reduction in the expenses. This reduction is not an advantage to the company in so far as it is a concomitant of reduced volume of business; it is satisfactory, however, that the management and general expenses are being reduced in a larger ratio than the profits. This is shown by the following figures:—

	Gross profits.	Management and general expenses.	Proportion.
1904-5	£300,414	£61,436	20·4 %
1905-6	316,297	54,467	17·2 %
1906-7	267,737	48,689	18·1 %
1907-8	250,559	27,446	10·9 %

"The price paid for the electrical energy for working the cars is a very large item in the working expenses, and in many cases an obligation has been placed upon the associated companies to take current at what is now a high price, the local authority supplying other and much smaller consumers at considerably lower prices. Where, however, the companies have been free to make the best arrangements for purchase or to generate their own current, the cost is less. The matter is receiving the attention of the directors with a view to securing better terms.

"The associated companies have, when the circumstances have been favourable, undertaken the supply of electricity in the districts served by their tramways, with a view to securing additional business for their power stations, and the economies ensuing from combined administration. The result of this has been a more general provision of electrical energy at more favourable prices than would otherwise have been commercially possible, and the improving results of the combined undertakings have prompted the directors to encourage this policy where the views of local authorities admit of it. With few exceptions the separate electricity supply undertakings have now passed the pioneer stage, and are more than covering expenses, and their returns are steadily improving. Where these undertakings are situated in districts suited for industrial development, they are beginning to feel the benefit of the tendency of the manufacturing trades to leave the more congested and heavily rated districts; and more recently the new Patents Act is causing foreign firms to make inquiries as to suitable sites, with a view to establishing factories in this country, in districts affording electrical services.

"Concerning the British Electrical Federation, the report says that about 60 undertakings have been federated for co-operative purposes, and a council has been constituted, consisting of the chairman or managing director of each of the federated undertakings. The directors believe that the results will be to increase the efficiency and economy of operation, and to strengthen the hands of the associated companies in dealing with opposing interests. Joint head office accommodation is to be provided for all the federated companies, and a building is in course of erection over the Holborn station (Kingsway) of the G.N.P. and B. Railway, which will be ready for occupation in the autumn of this year. Arrangements have been made for the collective purchase of stores on behalf of all the companies, and transactions to the extent of about £150,000 per annum are already being made to the advantage of the companies concerned. A mutual fund for the insurance against third party accidents was established by the companies in 1905, and this has been transferred to the Federation, which has also taken charge of all other insurance matters on behalf of the Federated Companies. The disbursements in respect of third party claims amounted in 1905 to £22,699, in 1906 to £19,278, and in 1907 to £17,663 (uncompleted). Even the largest of these amounts represents an economy upon the payments formerly made to insurance companies, notwithstanding that the volume of traffic was then much smaller than it is now.

"Parcels delivery systems have already been established on the following tramways and light railways: Birmingham and District, Gateshead, Hartlepool, Kidderminster, Leamington and Warwick, Merthyr, Potteries, Swansea, Tynemouth, Worcester, Yorkshire, and South Metropolitan. The business is being gradually extended to centres of other federated tramway companies, with every prospect of fair profits being earned. The Federation has been constituted on the basis of making no profit, and the expenses are distributed among the various companies in proportion to the services required by each."

The remainder of the directors' comments, which appear under the heading "General," we print in full:—

"The directors regret that, owing to the constant pressure put upon tramway companies to reduce fares and to increase facilities, the important services rendered by the associated companies to the public are not adequately rewarded. As a result also of the legislative and municipal burdens placed upon electrical enterprise in this country and of the severe competition of foreign producers with English manufacturers—a competition which has reduced prices of electrical apparatus to such an extent that profits have practically vanished—electrical undertakings are not as remunerative in this country as might be expected, and consequently many of the assets of this company have suffered severe depreciation in value. Nevertheless, the directors are of opinion that the market prices of the company's share and debenture capital are lower than the circumstances warrant, and this in a measure to be ascribed to the prevalent industrial depression and to the general stagnation on the stock and share market.

"The Board of Trade Return of Tramways shows that the net results obtained by the associated companies compare favourably with other similar undertakings; indeed, the associated companies show on an average a better net result in relation to capital expenditure and gross receipts than the average of other tramway undertakings in the country, whether worked by companies or by local authorities, particularly having regard to the fact that the lines worked by local authorities are to a much greater extent in the large cities where the traffic is heavy, while most of the lines worked by companies are on inter-urban and rural routes where the traffic is much lighter.

"Where companies have not been restricted in carrying out comprehensive electric traction enterprises, the undertakings have proved of great public utility, but the restrictions and the

impositions to which the industry has been subjected have arrested its development, and very little expansion can be expected in this country under either the Tramways or the Light Railways Acts until the conditions under which these undertakings can be promoted and operated are improved.

"That there is scope for the construction of further light railways in this country is generally admitted, and is emphasised in the report of the Light Railway Commissioners, in which it is also confirmed that 'proposals for new lines are now infrequent owing to the various difficulties in carrying them to a successful completion,' and 'that an improvement could be effected enabling the construction of many much-needed lines by an amendment of some of the provisions of the Light Railways Act, 1896.'

"While it is undeniable that the extensive business which has been established is thoroughly successful from the public point of view, and provides facilities which are of great benefit to a large section of the community, the directors regret that the results are not more profitable to the shareholders, but they are able to assure the shareholders that no efforts are spared by the management to increase the profits while properly serving the public. The directors are also satisfied that the staff is efficient and that the work of the companies is done with due economy. Furthermore, the strong financial position of the company and the wide experience of electrical enterprises which it is able to command, place the company in a favourable position for entering upon new undertakings when the general industrial and financial conditions of the country enable this to be done with prudence, and with prospect of fair and reasonable reward.

"In the meanwhile the directors are giving consideration to some of the proposals for electrical enterprise submitted to them from countries where the conditions for the investment of capital are more favourable than in this country, and although such proposals require extensive examination before commitments can be made, the directors are hopeful that they will be able in the near future to employ the resources of the company to the further advantage of the shareholders."

The Birmingham and Midland Tramways, Ltd.

THE meeting of this company was held recently at Donington House, Norfolk Street, Strand, Mr. C. B. S. HILTON presiding.

In proposing the adoption of the report (see ELECTRICAL REVIEW, June 12th), the CHAIRMAN said that although the company was called the Birmingham and Midland Tramways, as a matter of fact the business from which it derived its income was divided under three distinct heads—first, there were the tramways; second, the electric supply; and thirdly, their investments in subsidiary companies which were controlled and worked by the joint committee. Generally speaking, the companies in which they were interested had come through a trying time with considerable success. The one exception was the Omnibus Co. There the results were so unsatisfactory that in October last year the directors decided to entirely discontinue the motor-omnibus service, and only the horse routes and those which were entirely free from the competition of the municipal tramways, and which actually showed a profit, were continued. The passengers carried on the tramways last year numbered 10,732,000, against 13,255,000, and the receipts per route mile were £3,587, against £4,695. The average fare per passenger was rather less, due entirely to the effect of the running arrangements with the Birmingham Corporation, where they only got a proportion of the fares. With regard to the electricity supply, the amount sold to customers in 1906 was 171,783 units, whereas last year it was 525,556 units. That was a very satisfactory indication of how that business was growing, and he might say that those figures had been largely increased since the close of the year. He regretted to say that, so far, no agreement had been arrived at with the Dudley Corporation respecting the lease of the line there. The terms sought to be imposed on the companies were so onerous that to accept them would probably mean that in some instances no dividends could be paid, and in others that the dividends would be reduced. As the highest dividend paid by any of the companies interested was only 5 per cent., surely it was inequitable that in addition to paying interest and sinking fund on the purchase price, the local authorities should endeavour to extract a profit rental, which would cripple the companies and leave no fair return to the shareholders whose enterprise established the business. Since the close of the year the company had acquired a controlling interest in the Shropshire, Worcestershire and Staffordshire Electric Power Co. No doubt in the future that would entail upon them the necessity of finding further capital for the development of the Power Co.'s business, but the directors felt confident that the interest they had acquired in the concern would materially assist the development of their power supply business, and would justify the additional expenditure whenever it had to be faced.

SIR ERNEST SPENCER seconded the motion, and the report was adopted.

Prospectuses.—*British-Sumatra Rubber Estates, Ltd.*—This company has been offering for subscription 58,000 6 per cent. cumulative participating preference shares of £1 each.

Rio de Janeiro Tramway Light and Power Co., Ltd.—The list has been open this week for subscriptions for an issue of £900,000 5 per cent. 50-year mortgage bonds at 80 per cent.

Stock Exchange Notices.—The Committee has appointed special settling days as under:—

Wednesday, July 1st.—Newcastle-upon-Tyne Electric Supply Co., Ltd.—Provisional certificates for a further issue of 50,000 ordinary shares of £5 each (issued at £6 per share), fully and partly (£3) paid, of which £2 is capital and £1 premium, Nos. 87,501 to 137,500; and 50,000 5 per cent. preference shares of £5 each, fully and partly (£2) paid, Nos. 87,501 to 137,500.

Wednesday, July 8th.—United River Plate Telephone Co., Ltd.—Further issue of 20,000 ordinary shares of £5 each, fully and partly (£1) paid, Nos. 100,001 to 120,000.

Tuesday, July 14th.—Marconi's Wireless Telegraph Co., Ltd.—Further issue of 10,000 ordinary shares of £1 each, fully paid, Nos. 384,191 to 394,190.

All of the above, as well as the following, are to be quoted in the Official List:—

Mexico Tramways Co.—$600,000 additional General Consolidated first mortgage 50-year 5 per cent. gold bonds, Nos. 12,561 to 13,200 and 14,001 to 14,200 for $500 each, and 32,201 to 32,250, 33,001 to 33,500, 33,751 to 34,750, and 35,251 to 35,500 for $100 each.

Rio de Janeiro Tramway, Light, and Power Co., Ltd.—250,000 shares of $100 each; and a further issue of $564,000 first mortgage 30-year 5 per cent. gold bonds, Nos. 29,362 to 29,489 of $500, and 34,990 to 35,000, 55,236 to 58,000, and 73,001 to 75,224 of $100 each.

Applications have been made to the Committee to allow the following securities to be quoted in the Official List:—

Electrical Development Co. of Ontario, Ltd.—$5,650,000 additional five per cent. first mortgage 30-year gold bonds of $500 each, Nos. 1 to 10,450, 17,201 to 17,240, 17,251 to 17,770, and 18,001 to 18,200.

Kaministiquia Power Co., Ltd.—Scrip (partly paid) for $1,925,000 30-year five per cent. gold bonds.

Rangoon Electric Tramway and Supply Co., Ltd.—Further issue of 10,000 six per cent. cumulative preference shares of £5 each, fully paid, Nos. 30,001 to 40,000.

Rio de Janeiro Tramway, Light and Power Co., Ltd.—Further issue of $564,000 first mortgage 30-year five per cent. gold bonds, Nos. 29,362 to 29,489 of $500, and 34,990 to 35,000, 55,236 to 58,000, and 73,001 to 75,224 of $100 each.

Indian Electric Supply and Traction Co., Ltd.—The report for 1907 states that up to June 30th, 1907, expenditure was debited to capital account, and on July 1st, 1907, the revenue account was opened. The capital expenditure has proved to be in excess of the estimates, partly owing to the plague, which delayed completion of the works, and partly because revenue has not come in to meet the debenture interest so soon as was expected. It will be necessary, in the early part of next year, to raise further capital to pay off the indebtedness incurred, and to provide for extensions of the company's mains, which are required for the development of the undertaking. In the meanwhile arrangements have been made for the financial requirements of the company, including interest on the construction debenture stock, to the end of this year. The result of the first half-year's working has been a loss of £6,681, including payment of interest on construction debenture stock, amounting to £3,750. The working loss is mainly due to the tramway, the returns from which have fallen far short of the expectations formed of them.

Russia.—The Russische Allgemeine Elektricitäts Gesellschaft, of St. Petersburg, is declaring a dividend of 4 per cent. for the last financial year, as compared with 3 per cent. in the preceding 12 months.

Shawinigan Water and Power Co.—A dividend of 1 per cent. has been declared for the quarter ending June 30th.

Leamington and Warwick Electrical Co., Ltd.—The meeting of this company was held in London on Tuesday. The directors' report then submitted showed that the capital expended during the year was £2,293. The amount owing to the B.E.T. Co. for advances in connection with the reconstruction and equipment of the tramways and power station, &c., was £28,233, which it was proposed to repay as soon as arrangements had been made for issuing a portion of the authorised debenture stock. In the meantime interest at the rate of 4½ per cent is being paid on the loan. The working accounts show a net credit balance of £4,731 from tramways and electricity supply, and the total amount available for distribution of £3,613. The directors recommend to place to depreciation and reserve account, raising it to £4,300, £300; to place to a sinking fund £350; and to pay a dividend at the rate of 4 per cent. on the ordinary shares for the year, leaving to be carried forward £139. £350 has been placed to a provision for renewals account; this, with the further sum of £650, which they now recommend should be placed to other reserves, is double the amount provided last year. Owing to the inclement weather during the summer, the tramways receipts show a falling off of £615. The expenses of operation show a reduction of £407. The supply of electricity has progressed during the year. The expenses of this department, however, have been exceptionally heavy during the past year, owing to trouble experienced with some of the plant at the power station, which necessitated an extensive overhaul of the plant. This resulted in a loss of £240 on the year's working.

Melbourne Tramway and Omnibus Co., Ltd.—A dividend of 4½d. per share for the quarter ending 30th inst., being at the rate of 15 per cent. per annum, has been declared.

Hobart Electric Tramway Co., Ltd.—The directors have declared a dividend of 1s. per share, payable on July 1st.

Montreal Light, Heat and Power Co.—The report for the year ended April 30th last shows gross earnings $3,792,218, and operating expenses, renewals, &c., $1,651,656, leaving net earnings $2,140,562. Of this, fixed charges absorbed $493,095, leaving net profits $1,647,467. After deducting dividends amounting to $1,020,000, there remains a surplus from the year's operations of $627,467.

MARKET QUOTATIONS.

Wednesday, June 24th.

CHEMICALS, &c.		Latest Price.	Fortnight's Inc. or Dec.
a Acid, Hydrochloric	per cwt.	5/-	..
a ,, Nitric	per cwt.	22/-	..
a ,, Oxalic	per cwt.	88/-	..
a ,, Sulphuric	per cwt.	5/6	..
a Ammoniac, Sal	per cwt.	42/-	..
a Ammonia, Muriate (crystal)	per ton	£33 10	..
a ,, ,,	per ton	£30	..
a Bleaching powder	per ton	£5 10	..
a Bisulphide of Carbon	per ton	£18	..
a Borax	per ton	£16	..
a Copper Sulphate	per ton	£22	..
a Lead, Nitrate	per ton	£28	..
a ,, White Sugar	per ton	£27	..
a ,, Peroxide	per ton	£33	..
a Methylated Spirit	per gal.	2/6	..
a Potassium Bichromate, in casks	per lb.	8½d.	..
a Potash, Caustic (75/80 %)	per ton	£30	..
a ,, Chlorate	per lb.	8½d.	..
a ,, Perchlorate	per lb.	9d.	..
a Potassium Cyanide	per lb.	7d.	..
a Shellac	per cwt.	148/-	18/- inc.
a Sulphate of Magnesia	per ton	£4 10	..
a Sulphur, Sublimed Flowers	per ton	£6 10	..
a ,, Recovered	per ton	£5 10	..
a ,, Lump	per ton	£5	..
a Soda, Caustic (white 70 %	per ton	£19 15	..
a ,, Chlorate	per lb.	6½d.	..
a ,, Crystals	per ton	£3 5	..
a Sodium Bichromate, casks	per lb.	3d.	..
a ,, Cyanide (basis 100 %)	per lb.	7d.	..
METALS, &c.			
b Aluminium Ingots, in ton lots	per ton	£80	£7 dec.
b ,, Wire, in ton lots	per ton	£180	£6 dec.
b ,, Sheet, in ton lots	per ton	£128	£6 dec.
c Babbitt's metal ingots	per ton	£50 to £130	..
c Brass (rolled metal 2' to 12') basis	per lb.	7¾d.	..
c ,, Tube (brazed)	per lb.	8¼d.	..
c ,, ,, (solid drawn)	per lb.	7¾d.	..
c ,, Wire, basis	per lb.	6¾d.	..
c Copper Tubes (brazed)	per lb.	9¼d.	..
c ,, ,, (solid drawn)	per lb.	9¼d.	..
g Copper Bars (best selected)	per ton	£72	£1 inc.
g Copper Sheet	per ton	£72	£1 inc.
g ,, Rod	per ton	£72	£1 inc.
e ,, (Electrolytic) Bars	per ton	£60 10	..
e ,, ,, Sheets	per ton	£76 10	..
e ,, ,, Rod	per ton	£65	..
e ,, ,, H.C. Wire	per lb.	7⅞d.	..
f Ebonite Rod	per lb.	3/3	..
f ,, Sheet	per lb	8/-	..
n German Silver Wire	per lb.	1/6½	..
k Gutta-percha, fine	per lb.	5/6 to 6/6	..
k India-rubber, Para fine	per lb.	3/8	1d. inc.
i Iron Pig (Cleveland warrants)	per ton	50/9	..
l ,, Wire, galv. No. 8, P.O. qual.	per ton	£14	5/- dec.
g Lead, English Ingot	per ton	£13	..
m Manganin Wire No. 26	per lb.	8/-	..
g Mercury	per bot.	£8	2/6 dec.
d Mica (in original cases) small	per lb.	6d. to 1/-	..
d ,, ,, ,, medium	per lb.	2/6 to 4/-	..
d ,, ,, ,, large	per lb.	4/6 to 8/6	..
p Phosphor Bronze, plain castings	per lb.	1/- to 1/1½	..
p ,, rolled bars & rods	per lb.	1/2 to 1/3	..
p ,, ,, strip & sheet	per lb.	1/2½ to 1/5	..
o Platinum	per oz.	100/-	..
e Silicium Bronze Wire	per lb.	9½d.	..
r Steel, Magnet, in bars	per ton	£55	..
g Tin, Block (English)	per ton	£126 10 to £127 10	£2 10 dec.
n ,, Wire, Nos. 1 to 16	per lb.	1/6½	½d. dec.
p White Anti-friction Metals—			
"White Ant" brand	per ton	£34 to £58	..
k Zinc, Sh's (Vieille Montagne bnd.)	per ton	£24	10/- dec.

Quotations supplied by:—

a G. Boor & Co.
b The British Aluminium Co., Ltd.
c Thos. Bolton & Sons, Ltd.
d F. Wiggins & Sons.
e Frederick Smith & Co.
f India-Rubber, Gutta-Percha and Telegraph Works Co., Ltd.
g James & Shakspeare.
k Edward Till & Co.
i Bolling & Lowe.
k Morris Ashby, Ltd.
l Richard Johnson & Nephew, Ltd.
m W. T. Glover & Co., Ltd.
n P. Ormiston & Sons.
o Johnson, Matthey & Co., Ltd.
p The Phosphor Bronze Co., Ltd.
r W. F. Dennis & Co.

Isle of Man Tramways Co.—In the Manx Chancery Court on the 17th inst, application was made, on behalf of Mr. W. H. Walker, accountant, as liquidator of the Isle of Man Tramways Co., to pass the accounts of the company, which collapsed at the same time as Dumbell's Bank. The statement showed there was £6,308 for distribution, and with this it is proposed to pay a final dividend of 1s. 0¾d. in the £. The total admitted claims were £115,682. Previous dividends to creditors of 12s. 6d. in the £ had been paid. The shareholders, whose capital exceeded £250,000, received nothing back.

Hungary.—The Vereinigte Budapest Electricitäts Gesellschaft, of Budapest, is declaring a dividend of 9 per cent. for the last financial year, as compared with only 8 per cent. in the preceding 12 months.

STOCKS AND SHARES.

Tuesday Evening.

Business in the Stock Exchange has come to something of a halt, and markets are much less busy at the end of the month than they were at its beginning. The usual talk of money being required for "window dressing" at the end of the half-year may have something to do with the abstention of the investor, but as money is so cheap as to be almost unlendable, there seems little object in the capitalist refraining from making his purchases now.

One of the features this week in the electricity departments is the flatness of Central London Railway stocks. The Ordinary and Deferred have fallen 4 and 5 points respectively, and this drop comes on the top of declines a week ago. The explanation appears to be that a few people ran prices up with small buying orders at the time the Franco-British Exhibition opened, and now that they want to sell, there is no one eager to relieve them of their holdings.

Metropolitan Consolidated is also a weak market, and shed 1½. The prior charge issues of the electrical railways are unaffected by the flatness in the Ordinary stocks, and remain firm.

New issues make their appearance undaunted by the unpromising aspect of the times. The Rio de Janeiro Tramway Light and Power Company has offered £900,000 5 per cent. 50-year mortgage bonds at 80, at which price the yield is 6¼ per cent. on the money. It is rather superfluous to say that stocks returning such interest are not to be numbered amongst gilt-edged securities.

Rubber is coming to the fore again, and the British-Sumatra Rubber Estates, Ltd., issued its prospectus on Monday. Another rubber company is due to appear at the end of the week, and the autumn exhibition of rubber at Olympia will, no doubt, still further quicken the interest in the industry.

The new Anglo-Argentine Tramways 4 per cent. Debenture stock is quoted at about ¼ premium for cash. Dealings in the stock are numerous. An unusual item in connection with the issue is that full payment of the remaining instalment, viz., £87 per cent., is due on Thursday, July 2nd. The Company's Second Preference shares suffered a setback to the extent of 1/16. Fresh negotiations are now afoot to obtain the necessary powers for other acquisitions by the Anglo-Argentine Tramways Company.

Telegraph issues have suffered a check in their upward march, inasmuch as rises are less numerous this week. Prices, nevertheless, continue very firm, and the tendency is to put them better. Anglo-American Telegraph Deferred fell ½, because of a slump in the American Railroad market. Marconi's weakened to half a sovereign. On the other hand, there are improvements in Cuba Telegraphs, Eastern Extension shares and Eastern Telegraph stock, Indo-Europeans, and several of the Debenture issues have risen ⅞ or 1 per cent.

National Telephones are unchanged, but Chili Telephones put on ¼, and American Telephone and Telegraph Ordinary stock continued its improvement.

The view in the electricity supply market is that Lord Cromer's Committee will make a strenuous effort to finish its work before another month has elapsed. Pending fresh developments in this direction, the market is quiet and featureless. Notting Hill shares have been favoured. County Preference declined, but prices, generally speaking, are very nominal. Urban Preference came in, and are offered at 2½.

Telegraph Constructions have been good, the price gaining 30s. Babcock Ordinary are 1/16 harder, and so are Dick Kerr's, although for engineering shares as a whole the course of the market lately has not proved cheerful.

Support was accorded to British Electric Traction shares, in spite of the proposal that dividend on the Preference shares shall be paid up to September last, *i.e.*, only half the full amount. Both the Ordinary and Preference are better, but whether this is a permanent advance may be open to doubt. British Westinghouse 6 per cent. prior lien Debentures are quoted at 36½, which is a discount of 1½ per cent. New General Tractions have received no benefit yet from the issue of a better report, the £5 Preference shares standing about 10s. No dividend has been paid on these 6 per cent. shares since May, 1901, but the interest is cumulative.

Pulford Bros., Ltd.—We are informed that the tenth annual meeting of this company was held at the registered offices in Liverpool, on 22nd inst. Mr. Egerton G. Pulford, the chairman, reported that the year's trading had again been most successful, and showed an increased turnover. It was resolved that the usual dividend of 25 per cent., free of income-tax, be paid for the year ended March 31st last, and that the balance of profit be carried to reserve fund.

SHARE LIST OF ELECTRICAL COMPANIES.

TELEGRAPH AND TELEPHONE COMPANIES.

Present Issue.	NAME.	Stock or Share. *	Dividends for the last four years. 1904.	1905.	1906.	1907.	Closing Quotations June 16th.	Closing Quotations June 23rd.	Business done week ended June 23rd, 1908. Highest	Lowest.	Rise + or Fall —	Present Yield per cent. £ s. d.
25,000	Amazon Telegraph Co.'s shares, Nos. 1 to 25,000	10	Nil	Nil	Nil	Nil	2 — 3	2 — 3				Nil
143,300	Do. do. 5 % Debs., Nos. 1 to 1,250 Red.	100	Nil	5 %	5 %	5 %	84 — 87	85 — 88	87	85½	+1	5 13 8
$131,551,400	American Telephone & Telegraph, Cap. Stock	$100	7½%	7½%	8 %	8 %	120 —124	120 —124	..	..	..	6 8 9
53,000,000	Do. Collat. Trust, 4% Bonds, 1 to 28,000 and 53,001 to 78,000	$1000	4 %	4 %	4 %	4 %	89 — 92	90 — 93	..	..	+1	4 6 0
598,180	Anglo-American Telegraph	Stock	2⅝%	3½%	3⅞%	3½%	59 — 62	59 — 62	..	..	..	5 12 11
3,200,910	Do. do. do. 6 % Pref.	Stock	5½%	6 %	6 %	6 %	104 —105	104 —105	104½	104	..	5 14 3
3,200,910	Do. do. do. Deferred	Stock	Nil	½%	1½%	1 %	16⅜ — 17⅛	16⅜ — 16⅞	16⅝	16 3/16	— ⅛	5 19 5
50,000	Anglo-Portuguese Tel., 5 % Mort. Deb. Stock Red.	100	..	5 %	5 %	5 %	99 —102	99 —102	..	..	..	4 18 0
44,000	Chili Telephone, Nos. 1 to 44,000	5	8 %	8 %	8 %	..	7 — 7½	7½ — 7⅞	..	..	+ ⅛	5 3 3
2,383,376	Commercial Cable Stng. 500 year 4 % Deb. Sk. Red.	Stock	4 %	4 %	4 %	4 %	84 — 87	84 — 87	84½	..	..	4 12 0
16,000	Cuba Telegraph	10	5 %	5 %	5 %	..	7½ — 8½	7½ — 8½	..	..	+ ½	5 17 8
6,000	Do. 10 % Pref.	10	10 %	10 %	10 %	10 %	15½ — 16½	15½ — 16½	..	..	..	5 19 5
12,931	Direct Spanish Telegraph, Ord.	5	4 %	4 %	4 %	4 %	8 — 8½	8 — 8½	..	..	..	6 3 1
6,000	Do. do. 10 % Cum. Pref.	5	10 %	10 %	10 %	10 %	8 — 9	8 — 9	..	..	..	5 11 1
80,000	Do. do. 4½ % Debs.	50	4½%	4½%	4½%	4½%	100—103	100 —103	..	..	..	8 14 10
60,710	Direct United States Cable	20	3½%	4½%	4½%	..	13½ — 14	13⅝ — 14⅛	13⅛	13½	+ ⅛	6 10 9
53,700	Direct W. India Cable, 4½ % Reg. Deb., 1 to 1,200, R.	100	4½%	4½%	4½%	4½%	100½—102½	100¾—102½	102	..	..	4 7 11
4,000,000	Eastern Telegraph, Ord. Stock	Stock	7 %	7 %	7 %	7 %	131 —136	133 —136	135⅝	133½	+1	5 2 11
2,000,000	Do. 5½ % Pref. Stock	100	5½%	5½%	5½%	5½%	84½ — 86½	84½ — 86½	86	84½	..	4 0 11
1,896,706	Do. 4 % Mort. Deb. Stock. Red.	Stock	4 %	4 %	4 %	4 %	100½—102½	100¾—102½	102½	102	..	3 18 1
800,000	Eastern Extension, Australasia, and China Tele.	10	7 %	7 %	7 %	7 %	12⅞ — 13⅛	12⅞ — 13⅛	13	12 15/16	..	5 5 8
752,400	Do. 4 % Deb. Stock	Stock	4 %	4 %	4 %	4 %	100½—102½	100¾—102½	101¼	..	..	3 18 1
269,700	East & S. Afric. Tel., 4 % Mt. Db., 1 to 8,000, red. 1909	100	4 %	4 %	4 %	4 %	100½—102½	101 —103	..	..	+ ⅛	3 17 8
200,000	Do. 4 % Reg. M. Debs. (Mauritius Sub.) 1 to 8,000	25	4 %	4 %	4 %	4 %	99½—101½	100 —102	..	..	+ ⅛	3 18 5
181,127	Globe Telegraph and Trust	10	5⅜%	5½%	5½%	5½%	10⅜ — 10⅝	10⅜ — 10⅝	10⅜	10 7/16	..	5 8 9
181,127	Do. do. 6 % Pref.	10	6 %	6 %	6 %	6 %	13⅜ — 14⅛	13⅜ — 14⅛	..	..	..	4 4 14
150,000	Great Northern Telegraph, of Copenhagen	10	24 %	24%	20 %	20 %	28 — 30	27½ — 29½	29⅛	28½	— ½	6 15 7
24,900	Halifax and Bermudas Cable, 4½ % 1st Mort. Debs., within Nos. 1 to 1,200, Red.	100	4¼%	4¼%	4¼%	4½%	100½—102½	100¾—103½	..	..	..	4 7 10
17,000	Indo-European Telegraph	25	18 %	18 %	18 %	18 %	53 — 56	54 — 57	..	..	+1	5 14 0
$41,380,400	Mackay Companies Common	$100	1 %	2 %	3½%	4 %	60 — 70	60 — 70 xd	..	..	..	5 14 4
$50,000,000	Do. do. 4% Cum. Pref.	$100	4 %	4 %	4 %	4 %	60 — 70	60 — 70 xd	..	..	..	5 14 4
384,190	Marconi's Wireless Telegraph	1	Nil	Nil	Nil	Nil	⅜ — ⅝	7/16 — 9/16	9/6	9/3	— 1/16	Nil
72,680	Monte Video Telephone Co., Ltd. Ord.	1	4 %	5 %	6 %	6 %	1⅝ — 1¾	1⅝ — 1¾	20/-	..	..	4 14 1
86,492	Do. do. do. 5 % Pref.	1	5 %	5 %	5 %	5 %	15/16 — 1	15/16 — 1	17/3	..	..	5 6 8
2,225,000	National Telephone, Pref. Stock	100	6 %	6 %	6 %	6 %	108½—110½	108½—110½	109½	108½	..	5 8 7
2,725,000	Do. do. Def. Stock	100	5 %	5 %	5 %	6 %	113 —115	113 —115	114½	113½	..	5 4 4
15,000	Do. do. 6 % Cum. 1st. Pref.	10	6 %	6 %	6 %	6 %	10½ — 12½	10½ — 12½	11½	..	..	4 16 0
15,000	Do. do. 6 % Cum. 2nd Pref.	10	6 %	6 %	5 %	5 %	10½ — 12½	10½ — 12½	..	..	..	4 0 0
250,000	Do. do. 5 % Non-cum. 3rd P., 1 to 250,000	5	5 %	5 %	5 %	5 %	5⅛ — 5⅜	5⅛ — 5⅜	..	..	..	4 8 11
2,000,000	Do. do. 3½ % Deb. Stock Red.	Stock	3½%	3½%	3½%	3½%	99½—101½	99½—101½	100½	..	..	3 4 0
1,716,598	Do. do. 4 % Deb. Stock Red.	100	4 %	4 %	4 %	4 %	102½—104½	102½—104½	..	..	..	3 16 7
179,313	Oriental Telep. and Elec. 1 to 171,504, fully paid	1	6¼%	7 %	7 %	8 %	1½ — 1⅝	1½ — 1⅝	..	..	..	5 16 4
50,000	Do. do. do. 6 % Cum. Pref.	1	6 %	6 %	6 %	6 %	1⅜ — 1½	1⅜ — 1½	24/6	..	..	4 16 0
99,100	Do. do. do. 4 % Red. Deb. Stock	100	..	4 %	4 %	4 %	90 — 93	90 — 93	..	..	..	4 6 0
99,400	Pacific & European Tel., 4 % Guar. Debs., 1 to 1,000	10	4 %	4 %	4 %	4 %	99 —102	99 —102	..	..	..	3 18 5
11,839	Reuter's	8	5 %	5 %	5 %	5 %	7½ — 8½	7½ — 8½	7½	..	..	4 14 1
99,100	Telephone Co. of Egypt, 4½ % Deb. Red.	100	..	4½%	4½%	4½%	99 —102	99 —102	..	..	..	4 8 3
3,083	Submarine Cables Trust	Cert.	6 %	6 %	6 %	6 %	127 —130	127 —130	..	..	..	4 14 4
100,000	United River Plate Telephone	5	8 %	8 %	8 %	8 %	6⅜ — 6⅞	6⅜ — 6⅞	6⅜	6 3/8	..	5 16 4
40,000	Do. 5 % Cum. Pref., Nos. 1 to 40,000	5	5 %	5 %	5 %	5 %	5 — 5¼	5 — 5¼	5⅛	..	..	4 15 3
30,008	W. Coast of America, 1 to 30,000 & 58,001 to 58,008	2	Nil	Nil	2½%	..	1⅞ — 1 15/16	1⅞ — 1 15/16	..	..	— ⅛	3 10 2
150,000	Do. 4 % Debs., 1 to 1,500 guar. by Braz. Sub. Tel.	100	4 %	4 %	4 %	4 %	99 —102	99 —102	..	..	..	3 18 5
207,980	Western Telegraph, Ltd., Nos. 1 to 207,980	10	7 %	7 %	7 %	..	13⅜ — 13⅝	13⅜ — 13⅝	13⅜	13½	..	5 0 11
800,000	Do. do. 4 % Deb. Stock Red.	100	4 %	4 %	4 %	4 %	100½—102½	101 —103	102½	..	+ ½	3 17 8
88,321	West India and Panama Telegraph	10	Nil	Nil	Nil	Nil	⅜ — ½	12/9	..	..	..	Nil
34,568	Do. do. 6 % Cum. 1st Pref.	10	6 %	5 %	8 %	6 %	8½ — 8⅝	8½ — 8⅝ xd	8 5/8	8 5/8	..	6 17 2
4,669	Do. do. 6 % Cum. 2nd Pref.	10	Nil	Nil	Nil	£2 6 0	8 — 9	8 — 9	..	..	..	2 7 2
80,000	D do. 5 % Debs., Nos. 1 to 1,800	100	5 %	5 %	5 %	5 %	101 —104	101 —104	..	..	..	4 16 2

ELECTRICAL RAILWAY, MANUFACTURING AND INDUSTRIAL COMPANIES.

320,000	Anglo-Argentine Trams, 10 % Nom. Cum. 2nd Pref., 260,008 to 580,007	5	8 %	8 %	8 %	9 %	8¼ — 8⅜	8 7/16 — 8 11/16	8⅜	8 7/16	— 1/16	5 3 7
260,007	Do. 6 % Cum. Prefs., 1 to 260,007	5	5¼%	5¼%	5¼%	5½%	6¼ — 6½	6½ — 6¾	6 7/16	..	..	4 8 6
266,600	Do. Permanent, 6 % Deb. Stock, 1888	100	6 %	6 %	6 %	6 %	141 —146	141 —146	..	..	..	4 2 2
285,100	Auckland E. Trams, 5 % 1st Mort. Deb. Stock	100	5 %	5 %	5 %	5 %	104 —107	104 —107	..	..	..	4 13 6
800,000	Babcock & Wilcox, 1 to 580,000	1	20 %	20 %	20 %	20 %	3⅜ — 4	3 13/16 — 4 1/16	81/3	77/6	+ 1/16	5 0 0
100,000	Do. do. 6 % Cum. Pref., 1 to 100,000	1	6 %	6 %	6 %	6 %	1 7/16 — 1 9/16	1 1/16 — 1 1/8	..	..	..	3 16 10
40,000	British Aluminium, Ord., 1 to 40,000	5	7 %	7 %	7 %	7 %	3 — 3¼	3 — 3¼	60/-	..	..	10 0 0
40,000	Do. do. 7 % Cum. Pref.	5	7 %	7 %	7 %	7 %	4 — 4½	4 — 4½	87/6	80/-	..	7 15 7
20,000	Do. do. "A" 6 % Cum. Pref.	5	6 %	6 %	6 %	6 %	4½ — 5½	4½ — 5	..	..	— ½	6 0 0
20,000	Do. do. 4 % Funding Certs.	5	4 %	4 %	4 %	4 %	3¾ — 4½	3¾ — 4½	..	..	..	4 14 1
288,300	Do. do. 5 % 1st Mort. Deb. Stock Red.	Stock	5 %	5 %	5 %	5 %	104 —108	104 —108	..	..	..	4 12 7
800,000	Do. do. 5½ % Loch Leven Debs.	100	..	..	5½%	5½%	97 —100	97 —100	99	97½	..	5 3 1
400,000	British Columbia E. Rail Def. Ord. Stock	100	6 %	6 %	6 %	8 %	125 —130	125 —130	..	..	..	6 2 2
800,000	Do. 5 % Pref. Ord. Stock	100	5 %	5 %	5 %	5 %	108 —112	108 —112	110½	110½	..	4 9 3
800,000	Do. 5 % Cum. Perp. Pref. Stock	100	5 %	5 %	5 %	5 %	107 —111	107 —111	..	..	..	4 13 1
283,000	Do. 4½ % 1st Mort. Debs., 1 to 6,250	40	4½%	4½%	4½%	4½%	99 —102	99 —102	..	..	..	4 8 3
220,000	Do. 4½ % Vancouver Power Debs., 1 to 2,200	100	4½%	4½%	4½%	4½%	101 —104	101 —104	..	..	..	4 6 2
133,301	British Electric Traction	10	6 %	3 %	Nil	Nil	1½ — 1⅝	1⅝ — 1¾	35/-	31/3	+ ⅛	Nil
161,497	Do. do. 6 % Cum. Pref.	10	6 %	6 %	6 %	3 %	4⅜ — 4½	4½ — 4¾	93/9	86/3	+ ½	6 3 1
1,478,553	Do. do. 5 % Perp. Deb. Stock	Stock	5 %	5 %	5 %	5 %	92 — 97	92 — 97	94½	93½	..	5 3 1
526,936	Do. do. 4½ % 2nd Deb. Stock Red.	100	4½%	4½%	4½%	4½%	74 — 78	75 — 77	75½	75	..	5 15 5
100,000	British Insulated and Helsby Cables	5	8 %	8 %	10 %	..	5⅜ — 6⅛	5⅜ — 6⅛	..	..	..	8 0 0
100,000	Do. do. 6 % Cum. Pref.	5	6 %	6 %	6 %	6 %	5⅜ — 6⅛	5⅜ — 6⅛	5⅞	..	..	4 16 0
600,000	Do. do. 4½ % 1st Mort. Deb. Red.	100	4½%	4½%	4½%	4½%	102 —105	102 —105	..	..	..	4 5 9
312,000	British Thomson-Houston 4½ % 1st Mort. Debs.	100	4½%	4½%	4½%	4½%	93 — 98	93 — 98	..	..	..	4 11 10
400,000	British Westinghouse 6 % Pref., 1 to 200,000 and 275,001 to 475,000	5	Nil	Nil	Nil	Nil	7/16 — 1/2	7/16 — 1/2	..	..	..	Nil
1,016,858	Do. do. 4 % Mort. Deb. Stock	100	4 %	4 %	4 %	4 %	45 — 50	45 — 50	..	..	..	8 0 0
50,000	Browett, Lindley & Co., Ord.	1	Nil	Nil	Nil	Nil	9/16 — 11/16	9/16 — 11/16	..	..	..	Nil
50,000	Do. do. 6 % Cum. Pref.	1	Nil	Nil	Nil	Nil	14/6 to 15/6	14/6 to 15/6	..	..	..	Nil
105,731	Brush Electrical Engineering, Ord., 1 to 105,731	2	Nil	2½%	Nil	Nil	0— ¼	0 — ¼	..	..	..	Nil
150,000	Do. do. Non-cum. 6 % Pref.	2	6 %	6 %	Nil	Nil	1/16 — 1/8	1/16 — 1/8	..	..	..	Nil
125,000	Do. do. 4½ % Perp. Deb. Stock	Stock	4½%	4½%	4½%	4½%	70 — 75	70 — 75	..	..	..	6 0 0
125,000	Do. do. 4½ % Perp. 2nd Deb. Stock	Stock	4½%	4½%	4½%	4½%	55 — 60	55 — 60	..	..	..	7 10 0
100,000	Buenos Ayres & Belgrano, 1 to 100,000	5	4 %	3 %	3 %	..	4⅛ — 4¼	4⅛ — 4¼	..	..	..	8 1 6
40,000	Do. do. "A" 6 % Cum. Pref., 1 to 40,000	5	6 %	6 %	6 %	6 %	4⅜ — 5¼	4⅜ — 5¼	..	..	..	5 17 1
27,500	Do. do. "B" do., 1 to 27,500	5	6 %	6 %	6 %	6 %	4⅜ — 5¼	4⅜ — 5¼	..	..	..	5 17 1
136,400	Do. do. 5 % Deb. Stock	100	5 %	5 %	5 %	5 %	110 —116	110 —116	..	..	..	4 6 2
190,000	Do. do. 5 % 2nd Deb. Stock	100	5 %	5 %	5 %	5 %	102 —105	102 —105	..	..	..	4 15 3
137,610	Calcutta Trams, 1 to 137,610	5	8 %	8 %	8 %	6 %	5⅝ — 6⅜	5⅝ — 6⅜	6	5½	..	4 14 1
80,000	Do. 5 % Cum. Pref., Nos. 1 to 80,000	5	..	5 %	5 %	5 %	5 — 5⅜	5 — 5⅜	..	..	..	4 13 0
850,000	Do. 4½ % 1st Deb. Stock	100	4½%	4½%	4½%	4½%	103 —106	103 —106	..	..	..	4 4 11
85,000	Callender's Cable Construction shares	5	12½%	15 %	15 %	15 %	9⅜ — 10⅛	9⅛ — 10⅛	9⅜	..	— ⅛	7 2 10
40,000	Do. do. 5 % Cum. Pref.	5	5 %	5 %	5 %	5 %	5⅜ — 5⅝	5⅜ — 5⅝	..	..	..	4 5 11
800,000	Do. do. 4½ % 1st Mort. Deb. Stock Red.	Stock	4½%	4½%	4½%	4½%	107 —109	107 —109	..	..	..	4 2 7
491,222	Cape E Trams., 1 to 491,222	1	5 %	Nil	Nil	Nil	7/16 — 9/16	7/16 — 9/16	..	..	..	Nil
450,000	Castner-Kellner Alkali, 1 to 450,000	1	4 %	6 %	8 %	12 %	1⅛ — 1⅜	1⅛ — 1⅜	26/9	..	..	8 14 7
215,045	Do. do. 4½ % 1st Mort. Deb. Stock	100	4½%	4½%	4½%	4½%	101 —104	101 —104	..	..	..	4 6 7
1,898,510	Central London Railway, Ord. Stock	Stock	4 %	4 %	4 %	3 %	78 — 82	75 — 78	78½	74 13/16	—4	3 16 11
553,195	Do. do. 4 % Pref. Stock	Stock	4 %	4 %	4 %	4 %	90 — 93	90 — 92	..	..	..	4 7 0
553,195	Do. do. Def. do.	Stock	4 %	4 %	4 %	2 %	61 — 64	58 — 59	59½	58	—5	3 7 10
1,480,000	City and South London Railway	Stock	2½%	1⅝%	2½%	2½%	39 — 41	39 — 41	..	..	..	6 0 0

* Unless otherwise stated, all shares are fully paid. † A period of nine months. ‡ From Manchester Share List.

Continued on next page

SHARE LIST OF ELECTRICAL COMPANIES.—(*Continued.*)

ELECTRICAL RAILWAY, MANUFACTURING AND INDUSTRIAL COMPANIES.—(*Continued*)

Present Issue.	NAME.	Stock or Share.	Dividends for the last four years.				Closing Quotations June 16th.	Closing Quotations June 23rd.	Business done week ended June 23rd, 1908.		Rise + or Fall —	Present Yield per cent.
			1904.	1905.	1906.	1907.			Highest	Lowest.		£ s. d
85,000	Crompton & Co., Nos. 1 to 85,000	*	2½%	2½%	5 %	5 %	1⅝ — 1⅞	1⅝ — 1⅞	..	..	..	8 0 0
100,000‡	Do. 5 % 1st Mort. Reg. Debs., 1 to 900 of £100, and 901 to 11,000 of £50 Red.	..	5 %	5 %	5 %	5 %	92 — 95	92 — 95	..	..	..	5 5 11
260,000	Dick, Kerr & Co., 1 to 260,000	1	10 %	10 %	10 %	10 %	1 1/16 — 1 1/8	1⅛ — 1⅛	..	..	+ 1/16	7 5 5
305,000	Do. do. 6 % Cum. Pref., 1 to 305,000	1	6 %	6 %	6 %	6 %	1 — 1⅛	1 — 1⅛	..	..	..	4 16 0
282,580	Do. do. 4½ % Deb. Stock	100	4½%	4½%	4½%	4½%	101 —104	101—104	..	..	..	4 6 7
60,000	Dublin United Trams. (1896), 1 to 60,000	10	6 %	6%	6 %	6¾%	12½ — 13½	12½ — 13½	..	..	..	4 18 2
59,987	Do. 6 % Pref. between 1 and 60,000	10	6 %	6 %	6 %	6 %	12½ — 13½	12½ — 13½	..	..	..	4 7 8
99,261	Edison & Swan Utd., "A" shs., £8 pd., 1 to 99,261	5	2½%	4½%	4½%	4½%	⅜ — ⅝	⅜ — ⅝	13/-	..	..	16 15 0
17,189	Do. "A" shares, 01—017,189	5	2½%	4½%	4½%	4½%	1⅝ — 2⅛	1⅝ — 2⅛	..	..	..	8 6 9
319,475	Do. 4 % Deb. Stock Red.	100	4 %	4 %	4 %	4 %	78 — 81	78 — 81	..	..	..	4 18 9
72,220	Do. 5 % 2nd Deb. Stock Prov. Certs. all pd.	100	5 %	5 %	5 %	5 %	85 — 87	85 — 87	..	..	..	5 14 11
112,100	Electric Construction, 1 to 112,100	2	Nil	Nil	Nil	Nil	⅛ — ¼	⅛ — ¼	..	..	..	Nil
31,390	Do. do. 7 % Cum. Pref., 1 to 31,390	2	7 %	7 %	Nil	Nil	1⅛ — 1⅜	1⅛ — 1⅜	..	..	..	Nil
25,000	General Electric Co. (1900), 5 % Cum. Pref.	10	5 %	5 %	5 %	5 %	7⅞ — 8⅛	7⅞ — 8⅛	..	..	..	6 1 3
200,000	Do. do 4 % Mort Deb.	Stock	4 %	4 %	4 %	4 %	87 — 90	87 — 90	..	..	..	4 8 11
78,000	Gt. N. & City Rail. Pref. Ord. "A" 4 %, 1 to 78,000	10	4 %	4 %	4 %	2½%	¾ — 1⅛	¾ — 1⅛	..	..	..	3 6 8
96,000	Greenwood & Batley, 7 % Cum. Pref.	10	7 %	7 %	7 %	..	10½ — 10⅝	10½ — 10⅝	..	..	..	6 10 8
80,000	Do. do. 5 % Mort. Debs.	100	5 %	5 %	5 %	..	102 —103	102 —103	..	..	..	4 17 1
40,000	Henley's (W. T.), Telegraph Works, Ord.	5	15 %	15%	15 %	15%	10½ — 11½	10½ — 11½	11½	11	..	8 18 10
40,000	Do. do. 4½ % Pref.	5	4½%	4½%	4½%	4½%	5 — 5⅛	5 — 5⅛	5⅛	..	..	4 1 10
150,000	Do. do. 4½ % Mort. Deb. Stock	Stock	4½%	4½%	4½%	4½%	104 — 106	104 —106	104½	..	..	4 4 11
50,000	India-Rubber, Gutta-percha & Telegraph Works	10	5 %	10%	10 %	..	15½ — 16½	15⅝ — 16½	16⅛	..	..	6 1 8
37,500	†Liverpool Overhead Railway, Ord.	10	1¾%	Nil	Nil	⅜%	1⅝ — 1⅞	1⅝ — 1⅞	..	..	..	Nil
10,000	† Do. do. Pref., fully paid	10	5 %	5 %	5 %	5 %	5½ — 6½	5⅝ — 6½	..	..	..	8 0 0
600,070	London United Trams. (1901), 1 to 50,007	10	6 %	3 %	3 %	..	6½ — 6⅝	6⅝ — 6⅝	..	..	..	4 8 11
399,930	Do. do. 50,008 to 100,000	10	6 %	3 %	3 %	..	6½ — 6⅝	6⅝ — 6⅝	..	..	..	4 8 11
125,000	Do. do. 5 % Cum. Pref., 1 to 125,000	10	5 %	5 %	5 %	5 %	7½ — 8½	7⅞ — 8⅛	8 1/16	..	..	6 1 3
1,331,000	Do. do. 4 % 1st Mort. Deb. Stock	100	4 %	4 %	4 %	4 %	81 — 86	81 — 86	..	..	..	4 13 0
5,732,062	Metropolitan Consolidated	100	3 %	2⅜%	1 %	⅜%	41⅛ — 42⅛	40 — 41	41⅛	40	—1⅛	1 4 4
2,640,914	Do. Surplus Lands	100	2⅜%	2⅜%	2⅜%	2⅜%	68 — 70	68 — 70	68⅜	..	..	3 18 7
3,235,000	Do. District	100	Nil	Nil	Nil	Nil	13 — 14	13 — 14	13⅜	13 3/16	..	Nil
314,016	Metropolitan Electric Trams., Defd.	1	Nil	Nil	Nil	..	3/32 — 5/32	3/32 — 5/32	..	..	..	Nil
500,000	Do. do. 5 % Cum. Pref.	1	5 %	5 %	5 %	5 %	1/16 — 1/8	1/16 — 1/8	15/7½	14/4½	..	6 8 1
350,000	Do. do. 4½ % Deb. Stock Red.	100	4½%	4½%	4½%	4½%	95 — 98	95 — 98	96⅜	96	..	4 11 10
245,500	Potteries E. Trc.	1	5 %	4 %	4 %	4 %	⅛ — ¼	⅛ — ¼	..	..	..	8 0 0
245,500	Do. 5 % Cum. Pref.	1	5 %	5 %	5 %	5 %	⅛ — ¼	⅛ — ¼	..	..	..	6 13 4
245,000	Do. 4½ % Deb. Stock	100	4½%	4½%	4½%	4½%	93 — 96	93 — 96	..	..	..	4 18 9
37,350	Telegraph Construction and Maintenance	12	15 %	15 %	15 %	17½%	29 — 31	30½ — 32½	31½	30⅞	+1½	6 9 6
150,000‡	Do. 4 % Deb. Bds., 1 to 1,500 Red., 1909	100	4 %	4 %	4 %	4 %	101 —103	102 —104	..	..	+1	3 16 11
3,599,200	Undergd. E. R., Lon., 5 % Profit Shar. S. Nts.	..	5 %	5 %	5 %	5 %	39 — 43	39 — 43	42	41½	..	11 12 6
66,666	Willans & Robinson, 1 to 30,000 & 80,001 to 116,666	1	Nil	Nil	Nil	10 %	⅜ — 1½	⅜ — 1½	..	..	..	8 0 0
66,666	Do. 6 % C.P., 30,001 to 80,000 & 125,001 to 141,666	5	Nil	Nil	..	6 %	8⅛ — 9⅜	8⅜ — 9⅜	..	..	..	8 6 5
46,404	Do. 4 % 1st Mort. Deb. Stock	100	4 %	4 %	4 %	4 %	70 — 74	70 — 74	70	..	..	5 5 8

ELECTRICITY SUPPLY COMPANIES.

15,000	Bromley (Kent) E.L. & P., 1 to 15,000	5	5½%	5⅜%	5⅜%	5½%	4⅜ — 5	4⅜ — 5	..	..	..	5 10 0
70,000	Do. do. 4½ % 1st. deb. stock	100	4½%	4½%	4½%	4½%	94 — 97	94 — 97	..	..	..	4 10 11
30,131	Brompton & Kens. Elec. Lt. Sup., Ord., 1 to 20,000	5	10 %	10 %	10%	10 %	6⅞ — 7⅛	6⅞ — 7⅛	7⅛	7⅛	+ ⅛	6 9 0
9,869	Do. do. 7 % Cum. Pref.	5	7 %	7 %	7 %	7 %	6⅞ — 7⅛	6⅞ — 7⅛	7 1/16	7	..	4 10 4
336,876	Central Electric Supply 4 % Guar. Deb. Stock	100	4 %	4 %	4 %	4 %	98 —101	98 — 101	..	..	..	3 19 3
80,000	Charing Cross and Strand Electricity Supply	5	8 %	5 %	5 %	5 %	3⅝ — 4⅛	3⅝ — 4⅛	..	..	..	6 1 3
80,000	Do. do. do. 4½ % Cum. Pref.	5	4½%	4½%	4½%	4½%	4⅛ — 4⅜	4⅛ — 4⅜	80/-	..	..	4 17 4
80,000	Do. "City Undertaking" 4½ % Cum. Prf.	5	4½%	4½%	4½%	4½%	3⅞ — 4⅜	3⅞ — 4⅜	85/-	..	..	5 2 10
445,736	Do. do. 4 % Deb. Stock Red.	100	4 %	4 %	4 %	4 %	95 — 98	95 — 98 xd	..	..	..	4 1 8
49,436	Chelsea Electricity Supply, Ord.	5	6 %	6 %	4½%	4½%	3 — 3⅛	3 — 3⅛	..	..	..	6 8 7
175,000‡	Do. do. 4½ % Deb. Stock Red.	Stock	4½%	4½%	4½%	4½%	101 —104	101 —104	..	..	..	4 6 7
70,595	City of London Elec. Lighting, Ord. 40,001—110,595	10	6 %	6 %	6 %	6 %	9½ — 10⅛	9½ — 10⅛	9 1/16	9⅛	..	5 14 3
40,000	Do. 6 % Cum. Pref., 1 to 40,000	10	6 %	6 %	6 %	6 %	12 — 13	12 — 13	..	..	..	4 12 4
400,000‡	Do. 5 % Db. Stk., Scrip. (iss. at 115) all pd.	..	5 %	5 %	5 %	5 %	124 —127	124 —127	..	..	..	3 18 9
800,000	Do. 4½ % 2nd. Db. Stk., Prov. Crts., all pd.	100	4½%	4½%	4½%	4½%	102 —105	102 —105	..	..	..	4 5 9
40,000	County of Durham Electrical Power, Ord.	5	£3 7 0	4 %	4 %	2 %	2⅝ — 3	2⅝ — 3	..	..	..	3 6 8
50,000	Do. do. do. 5 % Pref.	5	5 %	5 %	5 %	5 %	3⅞ — 4⅛	3⅞ — 4⅛	..	..	..	5 17 8
40,000	County of London Electric Lighting, Ord. 1—40,000	10	4½%	5 %	5 %	5 %	7⅞ — 8⅛	7⅞ — 8⅛	..	..	..	6 1 3
40,000	Do. do. 6 % Pref., 40,001—60,000	10	6 %	6 %	6 %	6 %	10⅜ — 11	10⅝ — 10⅞	10 3/8	..	..	5 9 1
400,000‡	Do. do. 4½ % Deb. Stock	..	4½%	4½%	4½%	4½%	107 —110	107 —110	108	..	..	4 1 10
400,000	Do. do. 4½ % 2nd. Deb. Stock	Stock	4½%	4½%	4½%	4½%	97 —100	98 —101	98½	98⅜	..	4 9 1
80,000	Edmundson's Electric Corporation, Ord. Shares	5	7 %	4 %	Nil	Nil	⅛ — ⅜	⅛ — ⅜	..	..	..	Nil
80,000	Do. do. 6 % Cum. Pref.	5	6 %	6 %	3 %	Nil	¾ — 1	¾ — 1	..	..	..	12 0 1
438,000	Do. do. 4½ % 1st Mort. Deb. Stk.	100	4½%	4½%	4½%	4½%	69 — 73	69 — 73	..	..	..	6 3 3
10,000	Folkestone, 1 to 10,000	5	5½%	5½%	5½%	5½%	4⅜ — 5⅛	4⅜ — 5⅛	..	..	..	5 4 9
10,000	Do. 5 % Cum. Pref., 1 to 10,000	5	..	5 %	5 %	5 %	5 — 5⅛	5 — 5⅛	..	..	..	4 10 11
90,000	Do. 4½ % 1st Deb. Stock	100	4½%	4½%	4½%	4½%	94 — 97	94 — 97	..	..	..	4 12 9
15,000	Hove, 1 to 15,000	5	8½%	9 %	9 %	8½%	6 — 6⅜	6 — 6⅛	..	..	..	6 10 9
21,000	Kensington and Knightsbridge Electric Ord.	5	12 %	10 %	10 %	10 %	7 — 8	7 — 8	..	..	..	6 5 0
90,000	Do. do. do. 4 % Deben. Stk.	Stock	4 %	4 %	4 %	4 %	96 — 99	96 — 99	..	..	..	4 0 10
10,000	London Electric Supply Corporation, Limited, Ord.	3	3 %	4 %	4 %	2½%	⅞ — 1⅛	⅞ — 1⅛	24/4½	..	..	5 8 1
70,000	Do. do. do 6 % Pref.	5	6 %	6 %	6 %	6 %	4⅛ — 4⅜	4⅛ — 4⅜	..	..	..	6 6 4
74,895	Do. do. 4 % 1st Mort. Deb. Stk. Red.	Stock	4 %	4 %	4 %	4½%	89 — 92 x	89 — 92 xd	..	..	..	4 17 10
200,000	Metropolitan Electric Supply, 1 to 100,000	5	10 %	10 %	8 %	6½%	4⅛ — 5	4⅛ — 5	96/10½	91/8	..	6 10 0
76,121	Do. 4½ % Cum. Pref. 1—71,106	5	4½%	4½%	4½%	4½%	4⅛ — 5	4⅛ — 5	..	..	..	4 10 0
220,000‡	Do. 4½ % 1st Mort. Deben. Stock	..	4½%	4½%	4½%	4½%	107 —111	107 —111	..	..	..	4 1 1
250,000‡	Do. 3½ % Mort. Deben. Stock Redem.	Stock	3½%	3½%	3½%	3½%	85 — 90	86 — 90	..	..	..	3 17 9
250,000	Midland Electric Corporation, 4½ % 1st Mort. Deb.	100	4½%	4½%	4½%	4½%	96 — 99	96 — 99	..	..	..	4 5 10
87,500	Newcastle-on-Tyne, 1 to 87,500	5	8 %	8 %	8 %	8 %	5⅞ — 6	5⅞ — 6	..	..	..	6 13 4
87,500	Do. 5 % Pref., 1 to 87,500	5	5 %	5 %	5 %	5 %	5⅛ — 5⅜	5⅛ — 5⅜	..	..	..	4 10 11
10,852	Notting Hill Electric Lighting	10	7 %	7½%	7½%	7½%	11⅞ — 12½	11⅝ — 12⅝	..	..	+ ⅛	6 0 0
20,000	Oxford, 1 to 96 and 407 to 20,310	5	7 %	7 %	7 %	7 %	5⅞ — 6⅛	5⅞ — 6⅛	..	..	..	5 12 0
50,000	Do. 4 % Deb. Stock	100	4 %	4 %	4 %	4 %	94 — 98	94 — 98	..	..	..	4 1 8
40,000	St. James' and Pall Mall Electric Light, Ord.	5	14½%	12½%	10 %	10 %	7⅞ — 8⅛	7⅞ — 8⅛	7 13/16	7⅞	..	6 3 1
20,000	Do. do. 7 % Pref. 20,001 to 40,000	5	7 %	7 %	7 %	7 %	6⅞ — 7⅛	6⅞ — 7⅛	6 13/16	..	..	4 16 7
150,000‡	Do. do. 3½ % Deb. Stock Red.	100	3½%	3 %	3½%	3½%	85 — 90	85 — 90	..	..	..	3 17 9
12,200	Smithfield Markets Electric Supply, Ord.	5	4 %	4 %	Nil	Nil	⅛ — ¼	⅛ — ¼	..	..	..	Nil
50,000	Do. do. do. 4 % Deb. Stock	Stock	4 %	4 %	4 %	4 %	70 — 74	70 — 74	..	..	..	5 8 1
65,000	South London Electricity Supply, Ord.	5	4 %	4 %	3 %	4 %	2⅛ — 2⅜	2⅛ — 2⅜	..	..	..	7 5 5
120,000	South Met. Elec. Lt. & Power, Ord.	1	Nil	2½%	2½%	2½%	⅜ — ⅝	⅜ — ⅝	11/8	..	..	3 6 8
117,968	Do. do. 7 % Pref.	1	7 %	7 %	7 %	7 %	1 1/16 — 1 1/8	1 1/16 — 1 1/8	..	..	..	5 6 8
200,000	Do. do. 4½ % 1st Deb. Stk.	100	4½%	4½%	4½%	4½%	99 —102	99 —102	..	..	..	4 8 3
80,000	Urban Electric Supply, Ord.	5	5 %	5 %	5 %	5 %	1 — 2	1 — 2	..	..	..	12 10 0
50,000	Do. do. 5 % Cum. Pref.	5	5 %	5 %	5 %	5 %	1⅞ — 2⅛	1⅞ — 2⅛	..	..	..	10 10 6
200,000	Do. do. 4½ % 1st Mort. Db. Stk. Red.	100	4½%	4½%	4½%	4½%	87 — 90	87 — 90	..	..	..	5 0 0
110,000	Westminster Electric Supply, Ord.	5	14 %	13 %	12 %	10 %	7⅛ — 8	7⅛ — 8	7 1/8	7 1/16	..	6 5 0
81,979	Do. do. 4½ % Cum. Pref. (Original 5 %—Red. to 4½ % from 31st Dec., 1908)	5	5 %	5 %	4½%	4½%	4⅞ — 5⅛	4⅞ — 5⅛	5 1/16	..	..	4 3 9

* Unless otherwise stated, all shares are fully paid. † Quotations on Liverpool Stock Exchange. ‡ Interim Dividend.

Bank rate of Discount 2½ per cent., May 28th, 1908.

CONVERTING HAND-BLOWN ORGANS.

By J. W. WARR, A.M.I.E.E.

Very nearly all hand-blown organs operate their feeders by rocking levers extending through the case of the organ. The first principle is shown in fig. 1, the horizontal lever having an up-and-down motion. Then there is the left-to-

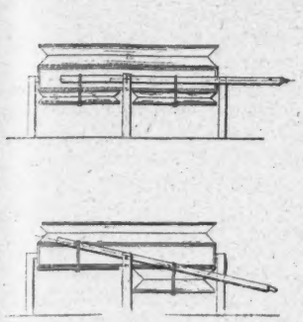


Fig. 1.

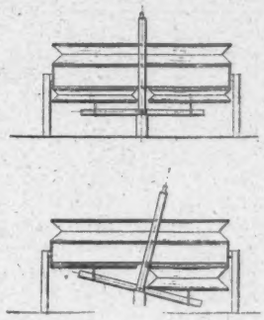


Fig. 2.

right movement of a vertically-centred lever moving the horizontal rocking bar shown in fig. 2, the former motion being in operation to a greater extent than the latter.

In some instances a rotary motion is applied to a shaft with a handle attached to a wheel, the shaft being cranked and fitted with connecting rods according to the number of feeders, shown in elevation fig. 3.

Many times I have been asked to drive the hand motions shown in the sketches, with an electric motor. Figs. 1 and 2 are not easy undertakings, unless the rocking motion has

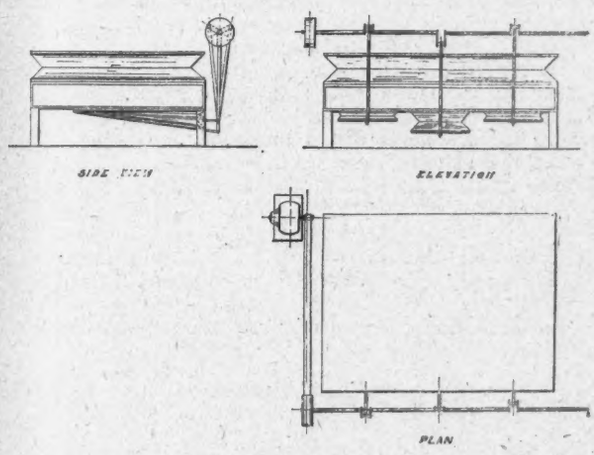


Fig. 3.

previously been replaced with a cranked shaft. When this is carried out the driving arrangements are similar to that shown in plan in fig. 3, this being the most inexpensive form of conversion.

It is the idea of utilising the existing feeders and other details, thus keeping down the initial cost, that has led to the adoption of this plan in several places. I am aware that there are more efficient and scientific appliances in existence, but on the score of low initial cost, reliability, silent running and absence of vibration, it has given most excellent results. I may say the system has lately been applied to a new three-manual tubular pneumatic organ, and since its inception has given entire satisfaction.

The first organ to be considered was one which was originally worked by hand, requiring the services of three men, who were considerably overworked if the organist made use of full organ for any length of time. Looking at fig. 4, it will be seen that the hand motion was similar to that described in fig. 1, rocking shafts operating the feeders. Three handles shown in plan, fig. 4, were connected to the feeders, and moved up and down. The two outside handles operated the low-pressure feeders providing wind for all the speaking pipes on the swell, great and choir organs. The third handle was connected to two smaller feeders supplying high-pressure wind to the pneumatic action of the great organ and pedal pipes. The remainder of the action was tracker and mechanical accessories. Accordingly a motor was installed with a 10-ft. drive to a 36-in. pulley on the crankshaft fixed in place of the rocking levers. The general arrangement is shown in fig. 5 with the connecting rods attached to the crankshaft. A liquid resistance similar to that shown in fig. 6, page 1084, was con-

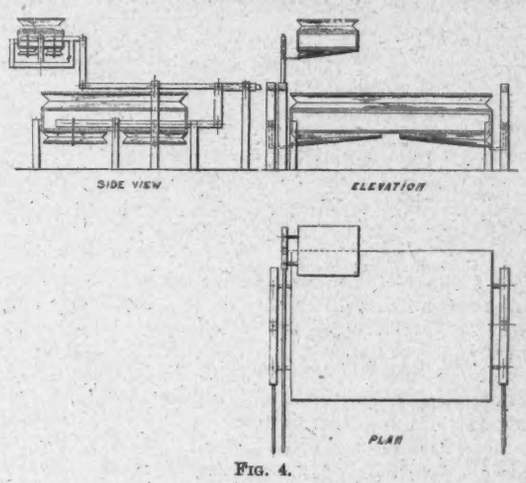


Fig. 4.

nected in the armature circuit of the motor for gradually reducing its speed as the wind chests became inflated. It will be noticed that as the wind chest rises, the lead dipper is drawn from the electrolyte, and increases the resistance of the circuit to such an extent that the difference of potential across the motor brushes is not sufficient to operate the motor. Breaking the circuit at the dipper with low-resist-

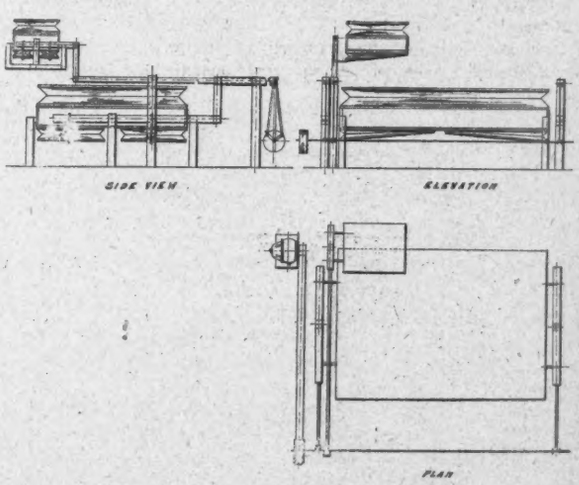


Fig. 5.

ance electrolyte causes the motor to make rapid pulsations when the organ is being played softly, the wind to the pipes of course being pulsating. An ordinary starting switch and main switch in series with the liquid resistance is fixed close to the keyboard, to enable the organist to put the motor in operation. The dipper of the liquid resistance was attached to the low-pressure wind chest, but when everything was completed and the organ played, the high-pressure wind fell off, thus putting the great and pedal organs out of action. After making the attachment to both wind chests, everything worked well.

The speed of the crankshaft at full organ is 32 r.p.m., the feeders making 64 strokes per minute. The rise of the high and low-pressure wind chests is 8 in. and 11½ in.

respectively. The motor takes 5 amperes, with a potential difference of 80 volts across the brushes and about 350 watts dissipated in the liquid resistance. The motor is provided with a 6-in. diameter pulley, and the speed of the motor is reduced by the resistance to 200 R.P.M. With the full pressure of 230 volts across the brushes the motor is capable of developing 1 B.H.P. at a speed of 1,300 R.P.M. The motor runs within 4 ft. of the organist's seat, and the resistance is at the back of the organ; the choir sit in front of the organ, and are about the same distance from the motor as the organist. When the organ is not being played, the motor immediately responds to the leakage wind, but during the period of rest 8 amperes is passing

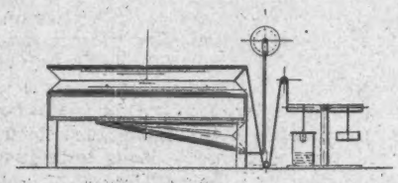


Fig. 6.

through the motor armature. This only takes place about every five seconds, and is not likely to cause serious overheating. At full organ the motor increases speed, the back E.M.F. rises and reduces the current to 5 amperes. To prevent the dipper from falling to the bottom of the liquid resistance, should the cord to the wind chest break, a weight is attached to the rocking beam as shown in the side view, fig. 6. The only attention required is the addition of a little soda solution every week-end and new electrodes every 12 months. A float in the liquid serves to indicate the height at which the solution should be kept by the organist or his assistant.

The cost of blowing this organ by hand was £10 per annum. The average cost of running by electricity over 12 months is 4s. 6d. per month, at 2d. per B. of T. unit.

There are 12 speaking stops on the swell organ, including three reeds, six on the pedal organ, 13 on the great organ, and nine on the choir, including one reed each respectively. There are five couplers and five composition pedals.

The conversion of another organ was more simple and not so expensive as that of the one just mentioned. One wind

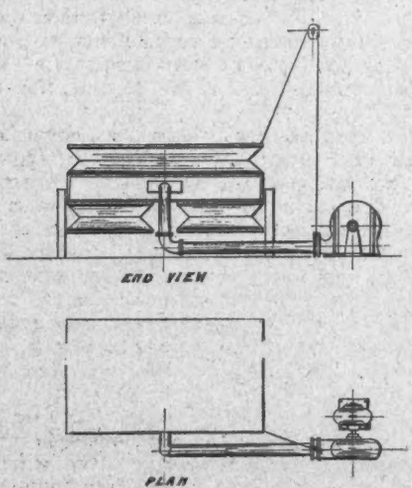


Fig. 7.

pressure only had to be dealt with, and the hand-blowing arrangement was a 30-in. wheel fitted with a handle rotating a three-throw crankshaft. A leather belt was placed over the wheel and motor pulley, and a liquid resistance installed for controlling the speed of the motor, as shown in fig. 6. To show that the working of the motor is silent, it is well to mention that both motor and resistance are inside the case of the organ, the choir sitting near to it.

With modern organs the various wind pressures required are not usually derived from separate feeders. One large set of feeders is employed, driven by one motor, and trunks or conveyance pipes are connected to the wind chest of these feeders, which in turn feed into auxiliary reservoirs provided with cut-off valves to shut off the main wind supply when inflation is complete. Weights are fixed on the tops of these reservoirs to intensify the wind according to requirements.

The ordinary alternating-current induction motor could not be used in the same manner as the continuous-current type. The chief drawbacks are:—(1) The disagreeable magnetic hum; (2) inability to start against load; (3) large starting current; (4) unsatisfactory speed regulation. The single-phase motor is undoubtedly the most inferior of its class as regards its starting performance.

With the advent of the single-phase repulsion induction motor, the unsatisfactory characteristics of the single-phase motor are, to some extent, left behind. This motor is capable of starting against heavy loads with low starting current, and has wide speed variation and good running performance. One particular type of machine consists of an ordinary induction motor stator, with wound rotor and commutator as fixed to continuous-current machines, with a pair of short-circuited brushes placed obliquely on the commutator. When the rotor has reached full speed an automatic device short-circuits the brushes, after which the rotor runs as an ordinary induction motor. Although we have with this motor nearly the same features as in the continuous-current type, the magnetic hum would prevent its being adopted in the manner specified in the first part of this article. On account of this drawback the motor has to be accommodated in some place where the hum is inaudible.

Some time ago the writer installed an ordinary single-phase 5-H.P. induction motor for supplying wind to a large organ. The arrangement was similar to that shown in fig. 7, except that a belt was used instead of direct coupling. The motor was provided with a broad-faced pulley driving an ordinary form of blower, fitted with fast and loose pulleys and a belt-shifting device for putting the blower in operation when the rotor had reached full speed. The running performance of the motor was not very satisfactory on account of the high frequency (100 periods).

A conveyance pipe of wood was fixed to the delivery end of the blower, and the wind chest of the existing feeders. A damper was placed close to the wind chest, but, as shown in the sketch, could have been placed close to the blower, to cut off the supply of wind when the wind chest was full.

The motor stator had a split-phase winding with the ordinary throw-over switch and resistance for starting, the rotor being of the squirrel-cage type.

With the induction repulsion motor, the arrangement could consist of a direct-coupled fan and motor, with a double-pole switch at the organ keyboard, thus doing away with the belt shifting device, and having to start and stop the motor in the vault.

STEAM BOILER EFFICIENCY AND LIVE STEAM FEED-WATER HEATING.—II.

By ALBERT JONEL.

The former part of this article dealt with the softening or detartarising effects of live steam; this part will deal with the subject from the heating and thermal efficiency standpoint.

The writer is fully aware, perhaps none more so, that very lofty claims are put forward by various people interested in live steam apparatus, to the effect that very large economies are to be obtained by its use; advertisements are to be found in the technical Press stating that *all* steam users can have their boiler efficiency *increased* by using some special design in the latest developments of this marvellous apparatus, and the results are guaranteed to be astonishing. The gist of the whole matter lies in the astonishment of the people who are gullible enough to try the system.

Some of the advocates of the system go so far as to put it in the forefront of stage-heating of feed water.

But of all the systems of heating feed water, it is the most

useless, the most expensive, and the one that will give most trouble and disappointment, when applied inside the boiler, and whether applied inside or outside the boiler, the thermal efficiency appears to be at a very considerable discount.

From discussions with various engineers, besides having followed special trials, and having seen log books giving the records with and without live steam heating of feed water, the writer has reluctantly come to the conclusion that any other engineer would come to on the subject—that no credence should be given to the statements of economy unless they are given on the authority of scientific results, carried out by men of the highest standing and unimpeachable independence, who will publish exactly what they find to be correct on trial. Unfortunately, such tests are not available, but failing them the writer has records in his possession, which were made under the supervision of engineers whose *bona fides* is unquestionable. But apart from special tests and trials, the log books of any station where live steam heating is used will show, without any doubt, that directly there is no economy by live steam heating.

The only economy possible is an indirect one, such as is obtained by thermal storage, where an advantage is secured by using the storage water at a high temperature and thus decreasing the number of boilers in use on the peak of the load of electric supply stations, or during sudden demands such as occur in various industrial undertakings. But the all-round boiler efficiency is not increased.

The writer could point to installations in London to-day where a definite economy was guaranteed by a live steam heating system; the makers have utterly failed to give the guarantee and the users refuse to pay, and in some cases the apparatus has been thrown on the makers' hands.

The principal agents for the disposal and sale of this system and its installation are "bluff" and "aromatic statements" and the "trust" that once the installation is complete it will be retained and paid for.

High Temperature Water.—Steam temperature feed-water is considered by some of the apostles of the system as a virtue; they contend that, if water is delivered by the heaters at the maximum available temperature, economy naturally follows. But delivering water at steam temperature *does not* necessarily give any thermal advantage. Instances are known where water has been delivered by heaters at steam temperature, and the rated efficiency of the boiler, instead of increasing in accordance with the assurance of the manufacturers of the apparatus, has actually decreased to an extraordinary extent.

It is claimed that, with steam temperature, a boiler can be forced practically to any extent without losing in efficiency. This is a fable, and belongs to the necromancy of this special system.

One Instance of Failure.—The engineer of one of the generating stations in London was approached some time ago, and a guarantee of 5 per cent. economy in fuel was given, with a promise of 10 or 12 per cent. The conditions were as follows:—

Boilers evaporated about 5,500 lb. water per hour. They were hand-fired.

Temperature of feed-water from Boby heater averaged 160° F.

Coal was carefully weighed.

Units generated at switchboard were duly registered at stated periods.

Boiler was isolated from ring main and coupled direct; first to a 200-KW. steam dynamo, afterwards to a 300-KW. steam dynamo.

Four tests were made with live steam heating, and four tests without live steam heating; duration of each test, six hours.

Temperature of water delivered by internal heater was approximately that of the steam.

The tests were entirely on a commercial basis, as will be seen, and under the management of competent engineers the trials would be indicative of the value of the system.

The writer was commercially interested in the trials, and trusted the *bona fides* of the manufacturer; he had every confidence in the unbiased decision of the engineers of the generating station, and waited with equanimity for the results.

What were those results?

Absolute and ignominious failure in every case. Instead of increasing the boiler efficiency, it was *very materially decreased*, and the trial of the 300-KW. set showed a remarkable increase in coal consumption over the tests on the 200-KW. set, on the same boiler when it was being forced.

These particulars are given for the benefit of those who are wanting advice on the subject of the live steam heating of feed water, as it really is important that steam users seeking information should also have some specific instances of actual practice apart from the advice of glib commercial practitioners.

There is no doubt about one feature, and that is, there is no thermal economy to be derived from it on cold or low-temperature feed-water.

But now comes the pretty part of this wonderful system; it is said to give economy if the feed water is raised externally, say by means of economisers, to within 100° or 130° F. of steam temperature, or internally by means of cylinders placed in the boiler; a very seductive romance is being built up in the recrudescence of this bubble, and statements are circulated that there is as good economy to be derived from its use as that obtainable by exhaust feed-water heaters.

The writer has copies of tests in his possession showing most marvellous savings which, if published, would create some astonishment even amongst the acutest of live steam feed-water heater manufacturers, and these tests were stated to be all right, until the tests mentioned above were made. When the true value was brought out, the engineer, who supplied the apparatus and previous tests, had the audacity to write and say that he was fully aware there was no economy to be derived therefrom.

My readers will observe that these remarks are not the result of second-hand information, but are derived from the Inner Temple, as it were, the holy of holies of the subject.

Perhaps, under the most favourable and exceptionable conditions, there may be some slight saving obtainable, but for the *great majority* of boilers in use, fully 90 per cent., no advantage whatever is to be derived from the use of the system, and no saving on the coal account.

The average temperature of feed-water to boilers does not exceed 190° to 210° F., and is probably not more than 150° to 160° F.

With economisers 240° is a high average temperature even for electric generating stations, and it is seldom they are put in large enough to give much higher temperatures, even with the higher steam pressures of to-day.

In the commercial trials given above there was 10 per cent. less units generated per pound of coal, when water was delivered by the heater at steam temperature—360° F.—than when it was delivered at 160° F. direct from the Boby heater.

In other words, the Boby exhaust steam heater, by raising the water from 60° to 160° F., was giving approximately 10 per cent. saving on the coal consumption over water if delivered direct to the boiler at 60° F.; but when the live steam heater was put on and the temperature of the feed raised to 360°, the saving by the Boby heater was wiped out.

What the loss would have been if the water had been supplied cold to the heater and raised from 60° to 360° F. was not ascertained, as it was considered that quite enough experience had been gained regarding the system, which was guaranteed to give anything up to 10 per cent. increased efficiency.

Now, will any responsible engineer, with a reputation to lose, maintain that the 10 per cent. decrease in current can, by increasing the temperature of the feed water by live steam to that of steam temperature, make a difference of 20 per cent. in the output, and give an increase of 10 per cent. to the efficiency of the boiler? Yet that is what is being claimed by the engineers (?) of the school of live steam heating of feed-water.

The simple fact remains that no responsible and independent authority has yet, after careful investigation, stated that there is any direct saving obtainable by the system, and until such authoritative statement is forthcoming, it is not advisable for steam users to give credence to the frenzied claims of wild and irresponsible commercialism.

Authorities.—If anyone knows anything on this subject, surely such responsible firms as Babcock & Wilcox should

have information, and they are not likely to lose sight of a system that can increase the efficiency of their boilers; yet in their book "Steam," it is stated that no economy is to be derived from this method.

The writer was recently informed by the manager of one of the principal boiler makers in this country, who was fully aware of trials which had been carried out on their boilers, that no saving whatever had been obtained.

One thing remains to be said, and it is that in live steam heating we are face to face with one of the choicest and most flagrant misstatements that have for some time been presented to steam users, when it is represented as giving generally increased thermal efficiency to steam boilers.

THE CHARGES FOR ELECTRICAL ENERGY SUPPLY IN FRANCE.

By GEORGES DARY.

(*Concluded from page* 1046.)

Toulouse.—La Société Toulousaine d'Electricité furnishes a meter supply of electrical energy for lighting and power purposes for the town of Toulouse (Haute Garonne Department).

Rates for Power Supply.—No guaranteed minimum annual consumption required. Up to 1 H.P., 4½d. per KW.-hour; 1 to 3 H.P., 3d. per KW.-hour; 3 to 15 H.P., 2·5d. per KW.-hour; 15 to 100 H.P., 2d. per KW.-hour.

Clients in the second of the above classes, whose annual consumption exceeds 1,666 KW.-hours, are charged at the rate of 2d. per KW.-hour for any excess; those in the third (up to 15 H.P.) category, who consume more than 4,800 KW.-hours per year, pay for the excess at 1d. per kilowatt-hour. Finally, users in the 15-100 H.P. section only pay ·8d. per kilowatt-hour for any energy used above an annual consumption of 15,000 KW.-hours.

Lighting.—Domestic lighting, 7·68d. per KW.-hour; commercial houses, 6·72d. per KW.-hour; bakers, chemists, 5·76d. per KW.-hour; cafés, restaurants, theatres, 3·84d. per KW.-hour. If the annual consumption of those in the last category exceeds 1,250 KW.-hours, the rate for any excess is reduced to 3d. per KW.-hour.

The company contracts for the lighting of courtyards, staircases, shops and works at the rate of 2s. per 5-C.P. lamp per month; 2s. 9⅜d. per 10-C.P. lamp per month; and 4s. 4½d. per 16-C.P. lamp per month.

Bordeaux.—La Société d'Eclairage Electrique de Bordeaux et du Midi supplies the town and suburbs of Bordeaux conjointly with (1) La Société Française de Distribution et de Construction Electriques, (2) La Station d'Energie Electrique des Boulevards, (3) La Société Centrale d'Electricité, and (4) M. Tricoche. The rates charged by these five authorised concerns are uniform, the supply being by meter on the following scale:—Domestic lighting, 6·72d. per KW.-hour; commercial premises, colleges, churches, works, &c., 3·84d. per KW.-hour; public lighting, 3·36d. per KW.-hour; for energy for power or heating purposes there is a uniform rate for all clients of 3·84d. per KW.-hour.

The municipal authorities of Bordeaux are entitled to a tax of 1d. per KW.-hour on the energy consumed in suburban localities.

Electricity meters are installed by the companies and hired to the consumers at the following rates:—

	Monthly charge for Hire.	Monthly charge for Upkeep.
For meter up to 500 watts	1s.	2½d.
,, 1,000 ,, ...	1s. 2⅝d.	4⅛d.
,, 2,000 ,, ...	1s. 4½d.	7½d.
,, 3,000 ,, ...	1s. 7½d.	9⅜d.
,, 5,000 ,, ...	1s. 9⅜d.	1s.
,, 10,000 ,, ...	2s.	1s. 2⅝d.
,, 15,000 ,, ...	2s. 2⅛d.	1s. 4½d.
,, 20,000 ,, ...	2s. 4½d.	1s. 7½d.
,, 25,000 ,, ...	2s. 7½d.	1s. 9⅜d.

Small electric motors may be hired by consumers at 2s. per month per $\frac{1}{10}$-H.P. motor, 3s. 2⅝d. for ¼-H.P. machines, 4s. 4½d. for those of ½ H.P., and 6s. 4½d. for those of 1 H.P.

Nancy.—La Compagnie Générale d'Electricité de Nancy supplies electrical energy to the town of Nancy (Meurthe-et-Moselle) at the rate of—

Lighting...	4½d. per KW.-hour.
Power	2·9d. ,,

For energy for power purposes (1) the maximum tariff of 2·9d. decreases in proportion to the annual consumption, without regard to the hours of use, and again (2) a reduced charge is allowed for energy consumed at times other than lighting periods, the company allowing a rebate of 30 and 40 per cent. and the annual consumption being taken into account.

Similar reductions are also made in respect of electricity used for lighting purposes.

In conclusion, it may be stated that at Marseilles the charge for the public lighting is at the rate of ·13d. per hour per 25-C.P. metallic-filament incandescent lamp, and 1·7d. per hour per arc lamp—of 330 watts in the case of continuous current, and 400 watts alternating current.

From the particulars I have given, an idea can be obtained of the system of charges for the supply of electrical energy to which preference is given in France. Taking them in conjunction with the details I gave on a former occasion with regard to Paris and the Department of the Aude, it will be seen that the rates are very high in the case of steam-operated power stations. On the contrary, where water power is utilised the tariff is lower and the charges on a more rational scale, enabling electricity for lighting or power purposes to be cheaply supplied by contract. Coal being very dear in France, renders the cost of electricity prohibitive; in fact, electric lighting for private persons becomes a luxury, unavailable to all purses.

France should, therefore, utilise as far as is possible the waterfalls which are so numerous in the country; she should establish water-operated power generating stations in every part, and distribute the current in all the neighbouring districts. This is what is being done in Grenoble, at Lyons, throughout the Pyrenees district, and in the various Departments of the Mediterranean Littoral, and it is what should be done throughout France. The movement is spreading more and more. All the large rivers, utilised near their sources, may supply the electrical energy required in the basins watered by them. Paris, even, can, and eventually must, suppress her steam-operated generating stations, and supply herself from the east—that is, by means of the glaciers of the Alps—and draw from those all the electrical energy she requires. Let us hope that the time when this comes to pass will not be long.

[All conversions of money have been taken on the basis of 25 fr. to the £1 (1 fr. thus equals 9½d.), except below 50 centimes, when 10 centimes have been taken as = 1d.]

REVIEWS.

Standardisation Rules of the American Institute of Electrical Engineers. Second edition. New York: The American Institute of Electrical Engineers.

What strikes one most agreeably on lifting this little volume, is the remarkably cheap price at which it is issued; 10 cents if in paper covers (with a discount for quantities), and 25 cents if cloth bound, is sufficient to secure a copy. Evidently our American *confrères* do not intend to let the price of their standardisation rules stand in the way of their general adoption, and our standardisation Committee might do worse than imitate the good example set them.

The cloth-bound copies are interleaved with blank pages facing the matter, so that notes, emendations, or additional data can be filled in by the user at his pleasure, and this is a most convenient arrangement.

The matter consists of 360 paragraphs consecutively numbered and divided into five main sections, namely:—(1) Definitions and technical data; (2) Performance specifications and tests; (3) Voltages and frequencies; (4)

General recommendations; and (5) Appendices and tabular data. Each of these is divided into several sub-sections; many cross references are given to the various paragraphs; and, generally, it appeals to one as a very conscientious attempt concisely to standardise nomenclature, specifications, tests and allied subjects. As stated in the first paragraph of the rules, the definitions are to be considered as descriptive classifications rather than scientifically rigid definitions.

We notice two interesting definitions in paragraphs 2 and 3. Direct current is defined as "unidirectional current," continuous current as "a steady or non-pulsating current." In this country the terms continuous-current dynamo and direct-current generator are applied indiscriminately to the same machine. According to the foregoing definitions, the latter designation is the correct one.

Par. 29.—The name reactor or reactance coil is given to the apparatus commonly known as a choking coil, which is a distinct improvement.

Par. 38.—The designation unipolar is evidently preferred to acyclic or homopolar. The term unipolar as applied to an acyclic or homopolar generator is an absurdity, as it is impossible to produce a unipolar magnet or magnetic field.

The A.I.E.E. prefers to classify motors by their speed characteristics on load, and the four distinct types given are: constant speed, multi-speed, adjustable speed and varying speed.

Par. 55.—Reaction factor is given as "the ratio of the wattless volt-amperes to the *total amperes*"; this, of course, should read the *total volt-amperes*. It is correctly expressed in the form of a ratio in the next line.

The determination of efficiency and measurement of losses are gone into carefully and normal methods and conditions set out. Paragraphs 117 to 186 inclusive set out the losses in different classes of machinery and apparatus, cross references being given to previous paragraphs stating methods and conditions of testing such losses.

Frequencies are recommended of 25 cycles and 60 cycles; 50 cycles would probably have been a better figure for the latter, but it appears that 60 cycles is a common figure in the States, and the Committee refrained from interfering with it.

The Appendices deal with (A) Notation, (B) Railway Motors (a very important section), (C) Photometry and lamps. Here we notice the candle-power unit is taken as 100/88ths of the hefner; 100/91 is the more correct figure. Candle-metre is recommended instead of candle-foot.

In paragraphs 353 and 354 the spherical reduction factor of a lamp is given as—

$$\frac{\text{Mean spherical candle-power}}{\text{Mean horizontal candle-power}},$$

from which it follows that the total flux of light in candle-lumens $= 4\pi \times$ mean horizontal candle-power $\times$ spherical reduction factor.

Appendix D gives a useful table of sparking distances between opposed needle-points in air for various effective sinusoidal voltages; and Appendix E gives a table of resistance temperature coefficients of copper at different initial temperatures in degrees centigrade.

Taken altogether the book is well worth perusal, even should we not quite agree in every detail with all that it contains.

India-Rubber and its Manufacture. By HUBERT L. TERRY, F.I.C. London: Archibald Constable & Co., Ltd. 1907. Price 6s. net.

This little work is intended, as Mr. Terry explains in the preface, not as a working guide or hand book for the india-rubber manufacturer, but for the general reader and the technologist in other branches of industry. Seeing the manifold uses to which india-rubber and its congeners, gutta-percha and balata are put in a multiplicity of industries nowadays, and the lack of knowledge which prevails only too frequently, not only in lay but also in technical circles, concerning the properties of these raw materials, the methods of converting them into manufactured articles, and the attributes of the latter, it cannot be said that a volume dealing in a lucid and interesting fashion with these matters is a superfluity. Although there are many points with which Mr. Terry might, with benefit to the lay and industrial world, have dealt more fully than he has done, it must be said that the work always affords, even where it is not very illuminating, interesting and not difficult reading. From our own particular point of view, for instance, we should have liked to see a fuller description of the manufacture, properties and testing of goods intended for use in the various branches of applied electricity. In view of the great and growing importance of plantation rubber, the information given concerning planting, modern methods of coagulation and the properties of plantation rubber, is somewhat meagre; but no doubt Mr. Terry had in mind the fact that Mr. Herbert Wright, in his recent volume on "Hevea Braziliensis," has dealt fully with these matters.

In Chapter I a short, but very interesting, survey is given of the history and development of the rubber industry. Chapter II deals with the production and marketing of the raw materials, and in this connection Mr. Terry very rightly calls attention to the crude procedure according to which raw rubber is bought and sold. It would certainly appear desirable that more scientific methods should be introduced in this connection.

In Chapter III the main chemical and physical properties of india-rubber are described, and there are interesting paragraphs regarding the storage of rubber, the action of grease and oil, and of copper on rubber goods. It is a matter for regret, however, that practically nothing is said concerning the modern work of Harries and others regarding the chemical constitution of the hydro-carbon. The two succeeding chapters (IV and V) deal with Vulcanisation and India-Rubber Plantations respectively. In Chapter VI the great question of substitutes is referred to, and adulteration is discussed. There is much to be said for Mr. Terry's view that the production of inferior or adulterated goods is as often as not ascribable to the desire of the purchaser to obtain goods at ridiculous prices; but, on the other hand, it may be fairly contended that in regard to competition and its natural corollary, namely, the cutting of prices, manufacturers are scarcely irresponsible agents, and that it is for them to educate the buyer on the question of what is a fair price for a fair quality. Chapter VII contains an interesting description of reclaimed rubber and its manufacture, and Chapters VIII and IX deal with the manufacturing processes of washing, drying and compounding. Chapter X describes rubber solvents and their recovery, and Chapter XI, the manufacture and uses of rubber solution. The subject of the succeeding chapter is fine cut sheet, which, *inter alia*, is used for strip in cable making. Chapter XIII deals with elastic thread, and subsequently (Chapter XIV) the manufacture of "mechanical" goods such as hose, buffers, washers, rings, heels, packing, belting, mats, &c., is gone into. After referring briefly (Chapter XV) to the production of such articles as balls, sponges, surgical goods, dental rubber, gloves, toys, tubing and water bottles, Mr. Terry passes on to proofed textures (Chapter XVI), tires (Chapter XVII) and boots and shoes (XVIII). Chapter XIX is of particular interest to the electrical reader, as it deals with rubber for insulated wires. The question of sophistication is referred to, and the suitability of rubber for deep-sea cable protection is discussed. In Chapter XX, on Vulcanite, the author calls attention to the backward state of the British industry in this regard as compared, for instance, with Germany's position. The question of contracts for india-rubber goods (XXI) is a highly important one, both to the manufacturer and the buyer, but unfortunately the author deals with it only in the most general manner. More detailed discussions on the manner of making contracts and of drawing specifications with regard to materials and methods of testing, would not have been superfluous. The chapter on the Testing of India-Rubber Goods (XXII) deals mainly with physical determinations, the chemistry of the subject being only lightly touched upon. The concluding chapters deal with gutta-percha and balata respectively. The book is neatly bound and is provided with 18 illustrations, a short bibliography and an index.

THE VOLTAGE REGULATION OF ROTARY CONVERTERS.

By "CALCULUS."

That there is a fixed ratio between the alternating and continuous voltages of a rotary converter is well known by all engineers familiar with these machines. In consequence of this fixed ratio, the methods commonly employed for regulating the voltage at the direct-current brushes, while different in principle, are all designed to produce the same effect, namely, to alter the pressure at the slip-rings with increasing and decreasing loads. There are now quite a number of ingenious methods employed for doing this, and although these are quite well known to designers and those connected with the construction of rotary converters, it is possible that others not so closely associated with this class of plant may be interested in a comparison of these methods.

One of the simplest, and consequently first-thought-of methods for hand regulation, is to bring tappings either from the high-tension or low-tension side of the transformers, and to change the tappings by means of a special switch, so as to give different voltages at the slip-rings. While this method is simple and easily understood, it is far from the ideal; indeed, some have gone so far as to say that it is no good. To change the voltage smoothly means

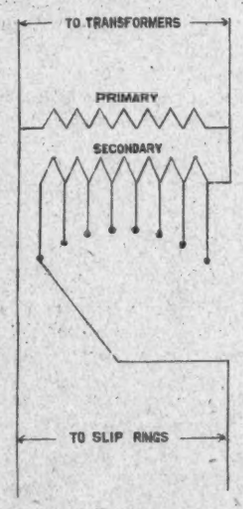


Fig. 1.

that there must be a large number of tappings brought out from the transformers, and this for more than one reason is objectionable. Then, again, the switch employed for changing the tappings must be most carefully designed and constructed, otherwise arcing may take place at the contacts. Such a switch, capable of performing the duty satisfactorily, cannot be produced cheaply. This, coupled with the additional cost of bringing the necessary tappings out of the transformer in a safe and otherwise satisfactory manner, will add to the cost of converting plant by an appreciable amount.

These considerations are sufficient to show that the method is not to be recommended, and, as a matter of fact, it is now seldom employed. It should be noticed, however, that given a proper switch a wide voltage variation can be obtained without interfering with the power factor of the machine. When this method is adopted a dial switch is generally inserted on the low-tension side of the transformers, as it is found easier to deal with heavy currents than with the high voltages commonly applied to the primaries of transformers used in conjunction with rotary converters.

The potential regulator or Stillwell's regulator is really a modification of the above method, and will be readily understood from the diagram, fig. 1, which shows a regulator of this kind in one phase only, although, of course, in actual practice, a regulator of this type would be connected in each phase. It will be seen that a transformer is connected in each phase between the step-down transformers and the slip-rings of the rotary converter, the secondary of this transformer being in series with each phase, and the primary in parallel. A switch arm is provided on each transformer by means of which the amount of secondary in series with the phases can be varied. The switch arms of the transformers are connected together, so that they are all moved an equal amount at the same time. Reversing switches are often connected in the primaries, which enable the voltage to be varied over a wide range with comparatively few tappings from the secondary windings. The main advantage of this method over the previous one is that it does away with the tappings from the step-down transformers. The boosting transformers, of course, need only be designed to furnish the regulating voltage; the method, however, cannot be a particularly cheap one.

Another arrangement, which has gained considerable prominence during the last few years, is to connect a rotary booster in series with the rotary converter between the step-down transformers and the slip-rings. This booster is really a little polyphase alternator excited with direct current in the usual manner. Clearly, this auxiliary machine must have the same number of poles as the rotary converter, since it is coupled to the rotary shaft and runs at the same speed. This is an extremely good method to employ where a wide voltage variation is required, since it enables the voltage to be varied over a wide range, and at the same time the power factor of the rotary need not be affected. It is also very convenient, since all that has to be done is to alter the excitation of the booster field, and the D.C. voltage of the rotary can be raised or lowered, just like the voltage of an ordinary direct-current machine. Obviously the great drawback about the method is the additional expense, otherwise there is little against it. Rotaries provided with boosters are frequently used in combined lighting and traction stations to enable the machines to be used on either the traction or the lighting bus-bars.

Then we have the induction regulator, which is another form of regulating transformer, connected in each phase between the step-down transformers and the slip-rings of the rotary in the same manner as the Stillwell regulator. The primary windings are placed in slots of a stator similar to the stator of an ordinary induction motor, and the secondary windings are placed on a movable member which corresponds to the rotor of an induction motor. In order to vary the voltage at the slip-rings of the rotary the secondary windings may be shifted through an angle corresponding to two poles on the stator. In this way the voltage induced in the secondary windings of the regulator can be increased or diminished. Usually the secondary is moved by means of a small continuous-current motor. This is another good method, which enables the voltage at the direct-current brushes of a rotary to be varied over a wide range without affecting the power factor of the machine. As in the previous methods, the extent to which the voltage can be raised is governed by the rotary itself. In his paper on "Rotary Converters *versus* Motor-Generators," read before the Manchester Section of the Institution of Electrical Engineers on December 4th, 1906, Mr. Miles Walker pointed out that when a rotary has a large number of poles, as, for example, when working on 50 and 60-cycle circuits, it is better to employ the induction regulator method than the rotary booster method, since the rotary booster must have the same number of poles as the converter itself. This, of course, means that when a rotary booster is used in such cases it must necessarily be a fairly big, and consequently expensive, machine.

With the induction regulator, on the other hand, the number of poles on the regulator is not governed by the number on the rotary; the poles on the induction regulator can be as few as desired. It was also pointed out on that occasion that the induction regulator needs to be air cooled; this, however, is not an objection when the step-down transformers are air cooled, since the air can be used for both purposes.

The most common method adopted in this country which may be employed for either hand or automatic regulation is to design the step-down transformers with a high inductive drop, or to place reactance coils between the step-down transformers and the slip-rings. Although the theory of this

arrangement is given in most standard text-books dealing with rotary converters, the continuous-current specialist may have a little difficulty in understanding how this arrangement acts, and a brief explanation may prove interesting to some.

For every rotary converter or other synchronous machine there is a certain value of the exciting current which gives a minimum input of current on the alternating side. If the exciting current be increased above this value, more current will flow into the converter, which will lead with respect to the E M F. Conversely if the exciting current is reduced

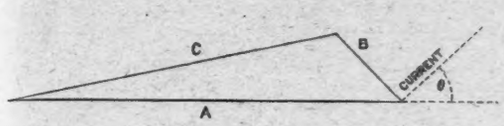


FIG. 2.

below the value which gives the minimum input, the input at the slip-rings will again be increased, but in this case the current will lag behind the E.M.F. Hence the excitation which gives the minimum input is the excitation which causes the machine to work at maximum power factor. If the excitation of a rotary converter is adjusted for unity power factor and left at this, the power factor will remain very near unity at all loads, as can be shown from the well-known V curves. In any circuit having inductance, a leading current will cause a rise in pressure, while a lagging current will cause a fall in pressure. This can readily be seen from the vector diagrams (figs. 2 and 3), where the line A is the voltage at the secondaries of the transformers, B the voltage due to the self-induction of the circuit, and C the resultant of A and B, or the voltage at the slip-rings. The voltage B, as shown, is, of course, always at right-angles to the current.

In fig. 2 the current is lagging behind the impressed E.M.F., while in fig. 3 the current is leading in front of the impressed E.M.F. That the line C in fig. 3 is longer than the line C in fig. 2 there is not the least doubt; hence, by increasing the excitation of a rotary converter and so producing a leading current, the voltage at the slip-rings can exceed the voltage at the terminals of the secondary windings

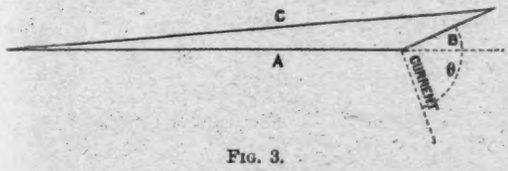


FIG. 3.

of the transformers, and by reducing the excitation and so giving rise to a lagging current the voltage can be reduced. If the transformers are designed with sufficient inductive drop, or if there are choking coils between the transformers and the rotary, the rotary will act much in the same way as an ordinary direct-current machine, and the field excitation may either be adjusted by hand, or a compound winding may be used, as is commonly done for automatic regulation. While fairly cheap and satisfactory, this method has the disadvantage that the power factor of the rotary cannot be maintained at unity. As, however, things can be arranged so that at times of heavy load the rotary draws a leading current, this fault is not so bad as it might appear, since the leading current usually has a good effect upon the generators, which are probably supplying lagging currents to induction motors, &c., in other parts of the circuit.

A scheme for regulating rotary converters which differs entirely from any of those previously described has been developed in America, and a number of machines have been arranged in this way and have been put into operation. The method was recently described in a paper read before the American Institute of Electrical Engineers on "Some Developments in Synchronous Converters," by Mr. Charles W. Stone, to which paper the author is indebted for the following particulars.

The method was first proposed by Mr. J. L. Woodbridge, and it differs from all other methods in that, instead of altering the pressure at the slip-rings of the rotary, the actual ratio between the direct and alternating voltages of the rotary is altered. It has been known for many years that the ratio of conversion can be changed by altering the width of the pole faces. This is the principle on which this comparatively new method operates. The

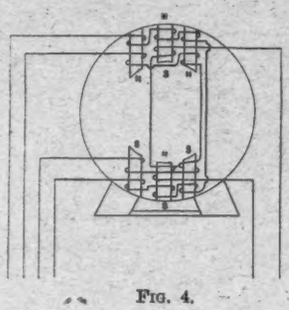


FIG. 4.

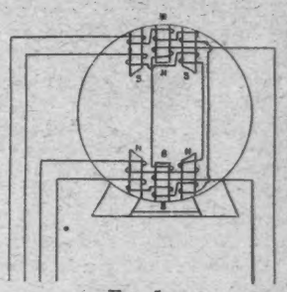


FIG. 5.

diagrams, figs. 4 and 5, explain the idea. Each pole is divided into three sections, and each section is provided with two windings, one of the windings of each section being the main winding and the other the regulating winding. The main windings are all connected in series and excited in the usual manner, but the regulating windings are connected differently. Those windings on the two outer sections of all the poles are connected in series with one another, and all the windings of the central sections are also connected in series with one another.

To increase the voltage on the direct-current side, all the outer sections are excited in a direction to assist the main shunt field, and the middle section an equal amount in opposition to the main field. The polarity of the various sections under this condition is shown in fig. 4. If both these windings are excited in the opposite directions, the condition of the poles will be as shown in fig. 5, and the voltage will be lowered. The only device required external to the rotary itself, is a field rheostat in the regulating field circuit, in addition to the main field rheostat. It is said that the machines which are at work on this principle give all the desired voltage regulation, and at the same time the power factor remains constant. It will be seen that while only an additional field rheostat is required, the increase in cost of making rotary converters in this manner cannot be a matter to be overlooked, and whether the system will gain prominence appears to be doubtful.

A modification of the method has been proposed by another American engineer, Mr. J. L. Burnham. According to this idea, each pole is composed of two sections instead of three, one is a large section, and the other smaller, and on each section only one winding is used. The large sections correspond to the ordinary poles of a rotary converter, and the regulation is obtained entirely by changing the excitation of the smaller sections. To raise the voltage the small sections are excited in one direction, and to lower it, in the other direction. It does not appear that either of these latter methods would give sufficient variation for all purposes for which rotaries are used.

NEW DOUBLE-FLOW TURBINES AT THE BRUNOT ISLAND POWER PLANT, PITTSBURG.

THE following particulars of the recent extensions made by the Pittsburg Railways Co. to their Brunot Island plant appear in the *Street Railway Journal*, and afford a striking instance of the increasing effect of steam turbines on power plant development.

The power-house was originally designed for 1,500-KW. reciprocating sets, but after five had been installed a change was made, and, in the space formerly intended for 4,500 KW., 18,000 KW. in turbines has been placed.

This has necessitated a large increase in boiler capacity, and a second boiler-house is being erected parallel with the present

building. It will contain 16 400-H.P. Babcock & Wilcox water-tube boilers, each fitted with Westinghouse new model Roney mechanical stokers.

The new turbine equipment is being supplied by the Westinghouse Machine Co., and consists of one 3,000-KW. and three 5,000-KW. double flow units.

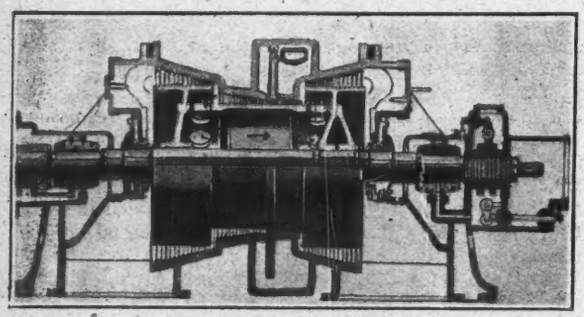
The former has been in operation nearly twelve months, whilst the latter are in course of erection.

The condenser pumps and auxiliaries of each unit are situated between the foundations. Each set rests on six reinforced concrete columns, and ample space has been left around the condensers. In fact, had it been necessary, these could have been placed entirely within the turbine foundations.

It is interesting to note that the concrete, which was necessary for the foundations of one of the original sets, would be sufficient to build the four foundations of the 18,000 KW. of the new double-flow turbines.

The high-pressure double-flow principle, as embodied in these sets, is essentially a modern development, although in modern hydraulic work and for exhaust steam turbines double-flow systems have been largely used to produce rotary elements running in perfect axial equilibrium.

In the high-pressure double-flow turbine an impulse wheel of large diameter has been adopted. High-pressure steam is brought to nozzle blocks placed in position in the impulse wheel chamber. These blocks cover only a small portion of the periphery of the impulse wheel, and ample space is left around the remaining



SECTIONAL VIEW OF NEW HIGH-PRESSURE DOUBLE-FLOW TURBINE.

portion to permit free circulation of the steam to all parts of this chamber, before it enters the Parsons element. In this way end thrust due to the impulse wheel is eliminated. As the steam is not expanded in the impulse element to more than about half the initial pressure, nozzles of divergent bore are unnecessary, and simple straight-sided nozzles are used.

From the impulse wheel chamber the steam enters the intermediate Parsons section of the turbine, around the entire periphery of the rotor. After traversing this section it divides along two separate paths, half entering one section of the low-pressure Parsons blading, and the other half passing through the interior of the rotor shell to the remaining section of low-pressure blading. The steam then passes into the exhaust connections and from thence to the condenser.

As will be seen from the accompanying view, the two low-pressure sections are placed at opposite ends of the rotor, and the impulse wheel and intermediate Parsons section lie between. The low-pressure elements being opposed in position, axial equilibrium is maintained.

It is claimed that, as a result of the use of this arrangement, a large reduction may be made in the weight of individual parts, the reduced span between bearings, as compared with the single-flow types, making it possible to run at higher speeds. The length of blade necessary in the low-pressure sections is also reduced. Further, the only balance piston required is one of small diameter for the intermediate Parsons blading, and the rotor cylinder is not exposed to high-pressure and high-temperature steam. The maximum pressure encountered is about 75 lb. per sq. in.

High-pressure and high-temperature steam are confined to the impulse chamber, for which the latter is well adapted. By its use also a reduction of nearly 50 per cent. in the shaft length is rendered possible.

The impulse wheel consists of a flanged cast-steel disk forced on the rotor body and securely keyed. The flange at the base is grooved and forms the dummy or balance piston for the intermediate element.

The low-pressure blading has been made of such diameter as to allow of blades of the same size as those in the intermediate stage being used.

Improvements have recently been made in the Westinghouse-Parsons blade construction, and a brief reference to them will be of interest.

It was early found that no one metal had all the physical properties desirable in a blading material, and a special compound metal has been developed which is exclusively used in Westinghouse machines. It is known as "Monnot," and consists of steel covered with a thin copper sheathing. Experiments have shown that pure copper offers the maximum resistance to chemical corrosion, and the steel core affords the requisite strength.

The reinforcing of long blades was formerly effected by inserting heavy brass wire in slots cut in the entrance edge of the blade, lacing this to the blades by thin copper wire and finally brazing the whole together.

Now, comma-shaped holes are punched in the blades, and similarly-shaped lashing wire is strung through these holes. After the blades have been caulked in, the tail of the lashing wire is sheared over by a tool. This wedges the tail into the space between the face and back of adjacent blades, and enables it to act as a key to prevent broken blades from injuring adjacent rows. In this way also the blades are securely interlocked, and vibration is prevented.

At each end of the turbine shaft, where it passes through the exhaust casing, a water sealed gland is provided. This effectually prevents the entrance of air to the condenser, or the escape of steam to the atmosphere when running non-condensing.

An adjustment bearing of the usual type is also fitted on the shaft, and by means of micrometer screws the upper and lower halves may be moved. In this way the axial position of the rotor is accurately known at all times.

As in all Westinghouse turbines running at or below 1,800 R.P.M., self-aligning babbitt-lined bearings are used, of sufficient area to operate without the use of forced lubrication.

For the connecting link between the turbine shaft and generator an effective form of coupling has been developed by the Westinghouse Co., and considerable variation in the shaft alignment is possible. It consists of two sleeves, one keyed to each shaft. Each has a number of projecting teeth which engage with projections on a surrounding collar.

The governing is on the familiar "puff" or "gust" system, giving a constant number of admissions per minute with a variable duration. The governor itself is of the fly-ball type, and actuates a small pilot valve. The actual work of moving the valves is accomplished by a small relay steam piston.

For convenience of synchronising, and for regulation of the load, the governor is fitted with a small motor and weight, by means of which the spring tension may be controlled from the switchboard.

OUR LEGAL QUERY COLUMN.

[*Questions addressed to this column should be written on one side of the paper only.*]

"SMETHWICK" writes:—"I shall be glad to have the views of your legal contributor on the following hypothetical case:—

"(1) As to the legality of a town councillor, whose principal business interests are the sale of lamp-oil and gas fittings, occupying the chair of an electricity committee.

"(2) Whether a councillor, being a shareholder in a concern with which the corporation is arranging for a large supply of energy, can have delegated to him, and legally agree to, a price for such supply.

"(3) Whether an agreement so settled, in the absence of knowledge of the circumstances, by the council, would be binding on the corporation, although sealed."

*** As to (1), there would be nothing illegal in the chair of a corporation electricity committee being filled by a man whose principal business interests were gas fittings and lamp-oil. The Public Health Act, which regulates these matters, contains no provision whereby a person interested in any business presumably inimical to the electric lighting schemes of a local authority can be held to be disqualified. Interest in a contract relating to the supply of electric fittings might disqualify, but not mere interest in a rival undertaking.

As to (2), Sec. 12 of the Municipal Corporations Act, 1882, provides that a person shall be disqualified for being elected and for being a councillor if and while he "has directly or indirectly, by himself or his partner, any share or interest in any contract or employment with, by, or on behalf of the council." But it is further provided that a person shall not be so disqualified, or be deemed to have any share or interest in any contract or employment, by reason only of his having any share or interest in "any company which contracts with the council for lighting or supplying with water or insuring against fire any part of the borough." At the same time, a councillor holding shares must not vote or take part in the discussion of any matter before the council relating to a contract in which he has a shareholder's interest (Sec. 22 (31)).

As to (3), with regard to this question there is no authority for the proposition that such a contract would not be binding on the council, although it might affect the position of the councillor concerned.

A Model Motor Boat Regatta.—A regatta for model motor boats, to take place on the lake at Wembley Park on the afternoon of Saturday, July 25th, is being organised under the auspices of *The Model Engineer*. Races for model steam, petrol, and electric boats will be arranged, and as some of the latest of these small craft are capable of speeds exceeding 10 miles per hour, some highly exciting performances are expected. In addition to prizes for the above events a silver challenge cup is being offered for an inter-club race for teams of four boats. Some specially fast boats are being built. There will also be an exhibition of model boats of all kinds on the same afternoon. Full particulars may be obtained from the Editor of *The Model Engineer*, Poppin's Court, Fleet Street, London, E.C.

NEW ELECTRICAL DEVICES, FITTINGS, AND PLANT.

Vacuum and Pressure Dry-Insulating Machine.

In the accompanying illustration (fig. 1) we show Messrs. Simpson & Brown's patent vacuum and pressure dry-insulating machine for electrical purposes. It is being supplied by Mr A. G. Brown, of 23, King Street West, Manchester, and it is claimed that by its use a very important reduction may be effected in the cost of armature and motor repairs, both in tramway and ordinary power service. It will deal with armatures, either on or off the shafts, field coils and magnet coils of all kinds and for all purposes. When the articles to be treated are placed in the machine, they are heated to the desired temperature, and while hot, are subjected to a high vacuum. In this way all the air, vapour and moisture is drawn away, leaving the articles thoroughly dry. Insulating varnish is then drawn by the vacuum into the impregnating chamber, through a suitable arrangement of pipes and valves,

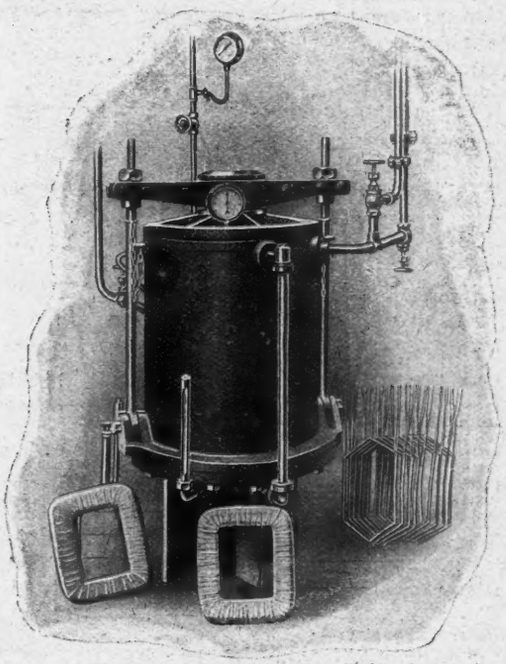


Fig.—Simpson & Brown's Vacuum and Pressure Dry-Insulating Machine.

completely flooding the articles under treatment. Air pressure is then applied, forcing the varnish into every part, interstice, and pore of the coil, permeating the covering, and thoroughly insulating every part. The varnish is then drained away, and the heat, which is still applied, dries the articles thoroughly before they are removed; if desired, they may be removed from the apparatus as soon as they have drained, and allowed to dry in the room, but it is claimed that the best results are obtained if the articles are thoroughly dried in the machine. The latter is recommended to tramway engineers as a means for treating and re-insulating their armatures and field coils as an insurance against sweating and consequent trouble. Where steam is not available for heating purposes, or where only very low pressure steam or hot water can be obtained, the maker supplies an electric heating apparatus for this purpose.

The Cuttriss Rectifier.

Mr. S. W. Cuttriss, of Prudential Buildings, Park Row, Leeds, is supplying a rectifier (provisionally patented), for transforming alternating current to continuous current, by means of which users of accumulators who have only an alternating current available will be able to charge their accumulators from the alternating circuits without employing a motor-generator. In addition to accumulators for motor-cars, X-ray work, dental apparatus, &c., the rectifier can be used for working electro-motors, medical appliances, arc lamps for optical lanterns, electrolysis, and all purposes where a continuous current is required. The apparatus (fig. 2), although it has only one cell instead of four as hitherto used, utilises both phases of the current. It is claimed to be simple in operation and inexpensive to maintain. No corrosive acid is used, only an inexpensive salt (sodium phosphate) which is supplied with the apparatus, and no action takes place when it is not in operation. A special transformer has been designed to reduce the voltage of the supply to the amount required, instead of using incandescent lamps. This transformer forms part of a complete switchboard, which also contains an ammeter, switch, fuse and the necessary terminals. No additional apparatus is required, and the supply may be taken direct from a lamp holder by means of an ordinary connector. The rectifier may be used for charging several accumulators at the same time and

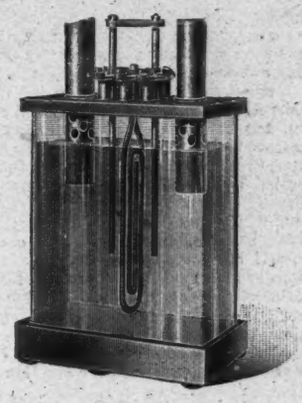


Fig. 2.—The Cuttriss Rectifier.

can be worked continuously without attention. There is no danger of the cells discharging through the rectifier, should the current be accidentally cut off.

LEGAL.

A Fife Colliery Prosecution.

The introduction of electric apparatus in the working of Fife coal mines has thrown new responsibilities on the managers, and there were some interesting revelations in this connection at a series of prosecutions at the instance of the Home Office, under the Coal Mines Regulation Act, at Dunfermline on Monday last week. The cases were a sequel to the recent deplorable accident which occurred at the Mary Pit, Lochore, whereby three men were killed and half a dozen severely injured.

In the first case John Allan, the colliery manager, Lochore House, was charged with having, on February 1st and 2nd, at the Mary Pit, caused or permitted to be stopped an unenclosed continuous-current electric motor, installed to work a fan for the purpose of constantly producing an adequate amount of ventilation, and in consequence of allowing the motor to be stopped, failed to constantly produce the amount of ventilation adequate to dilute and render harmless the noxious gases. He was further charged with neglecting to have the motor covered or safeguarded over, to have the switches or current-carrying parts sufficiently protected, and to have a safety lamp for the detection of fire damp provided for use at the motor. He pleaded guilty, and an agent made a statement on his behalf. He stated that Mr. Allan was 58 years of age, and for the long period of 30 years had been a colliery manager. During the last six years he had been in the service of the Fife Coal Co. The whole of this long period was clear of fault, with the exception of the present charge. It was further pointed out that Mr. Allan had charge of two pits, which were 1½ miles apart, and he had a great deal of work to attend to. He admitted, with regret, that he did not give definite and authoritative orders that the fan should be kept going during the week ends, and that he had not, from time to time, made inquiries to ascertain that it was kept going, but he believed it was, and did not learn that it had not been kept going until the time of the accident. Mr. Allan was strongly of opinion that there would have been no accumulation of gas and no accident if the screen at the fan had been left open during the week-end. The disaster ought to have been prevented by an inspection before the fan was started, as it would have given warning of the presence of gas and of the danger of switching on the electric current until the gas had been cleared away. The inspector ought to have withdrawn the men until suitable means had been found to re-establish proper ventilation in the workings. The Sheriff imposed a fine of £2, with the option of 10 days' imprisonment.

Andrew Ramsay, the under-manager, was also charged in connection with the ventilation. He pleaded not guilty, and evidence was led at great length. Henry Rowan, manager of the Fife Coal Co., stated that he gave instructions to Mr. Allan as to where the motor was to be situated, but he did not think it necessary to give other instructions. A number of the workers also gave evidence, and John McGinn, 19 years of age, who carried out the work of inspection on the night of the accident, stated that he had never read the fireman's rules and was never supplied with them. The first night that he made an inspection a miner showed him the way to start the motor. John Allan, colliery manager, in the course of his evidence, stated that he gave no definite instructions to Ramsay or anybody else to keep the fan going. Another witness stated that since the accident they had been driving the fan with compressed air, but he considered that the fan was now running slower. It also came out that the screen at the motor was down when the men left the pit on the Saturday afternoon. A workman, describing

the explosion, said he saw before the accident two or three big sparks coming from the motor, while a miner, asked if, when the motor was going, they had plenty of air, replied, "it took it all its time."

Prof. Redmayne, His Majesty's chief inspector of mines, stated that the motor was started under the most unfavourable conditions, and an accident was a question of time only. Considering the combination of circumstances, it was a marvel that it did not happen sooner. The accused, giving evidence on his own behalf, stated that he told Mr. Allan that the fan should be kept running during the week end, but he replied just to go on as they were doing. Mr. Allan was aware the fan was stopped during the week end. Mr. J. S. Soutar, Procurator Fiscal, commented in strong terms on the facts revealed by the evidence. The beginning of it was, he said, the higher officials of the company putting into the hands of unqualified men a machine which was one of the most dangerous, and which was put in under the worst of conditions. A person might just as well have given a child a box of matches and set it loose in a powder magazine. The keeping of this fan going was simply a question of cost and trouble. The sheriff stated that the accused, knowing that this preposterous system of ventilation was in existence, must accept responsibility, and he convicted upon that ground. They had evidence that this was the fourth occasion on which this absolutely unqualified fireman (McGinn) was allowed to inspect. That pointed to considerable inefficiency in the control of the mine. A fine of £1 with the alternative of eight days' imprisonment was imposed.

The fireman was charged with having caused or permitted John McGinn, roadsman, to be employed to perform the duties of inspecting, McGinn being an incompetent person inasmuch as he was ignorant of the duties. Accused, who admitted the charge, was admonished.

In view of compensation claims to be made on behalf of the injured men and the relatives of the dead, the evidence in the various cases was closely followed by the agents of the insurance companies and the Miners' Association. The sums claimed amount to several thousands.

ESCOTT *v.* MINEHEAD ELECTRIC SUPPLY CO.

AT Taunton County Court last week a compensation case had been adjourned from the last Williton County Court, in which the applicant was Mrs Clara Escott, of 17, Quay Street, Minehead, and the respondents the Minehead Electric Supply Company, the claim being in respect of the death of James Escott, a labourer employed by the Company, and husband of the applicant, whose death was due to carbon-monoxide poisoning. Deceased died on February 6th, and the claim was £156. The case was adjourned to settle a point as to whether the cause of death came under the schedule of the Workmen's Compensation Act, and could be regarded as an accident.

The case was again adjourned, his Honour wishing to secure expert knowledge as to whether poisoning by carbon-monoxide could be placed in the same class of the schedule as carbon-bisulphide, which was mentioned.

CONSOLIDATED ELECTRIC SUPPLY CO., LTD.

THE case of the Consolidated Electric Co., Ltd., against the Consolidated Supply Co., Ltd., which was a debenture-holder's action, came before Mr. Justice Swinfen Eady on Saturday last.

MR. WHITMORE RICHARDS asked for judgment in default of defence. Appearance had been entered, but the defendant did not now appear. A breach of condition took place by reason of the non-payment of interest for two months, and there was a notice calling in the money pursuant to the condition of the debenture.

His LORDSHIP gave judgment accordingly.

ERNEST SCOTT AND MOUNTAIN *v.* KENT COLLIERIES, LTD.

ON Tuesday last, Mr. Muir Mackenzie, the Official Referee, delivered judgment in this case, recently reported in our pages. He awarded plaintiffs £2,943. To defendants in respect of their counterclaim he allowed £1,117. He therefore gave judgment for plaintiffs for £1,826. The question of costs remains over for discussion. Our report of the judgment will be published next week.

NEW PATENTS APPLIED FOR, 1908.

Compiled expressly for this journal by W. P. THOMPSON & Co., Electrical Patent Agents, 322, High Holborn, London, W.C., and at Liverpool and Bradford, to whom all inquiries should be addressed.

12,364. "Improvements in or relating to electrically-actuated pumps." F. ROBERTS and M. P. ROBERTS. June 9th.

12,389. "Improvements in and relating to oil switches and the like for alternating currents." SIEMENS BROS. DYNAMO WORKS, LTD., and M. KLOSS. June 9th. (Complete.)

12,390. "Improved means for obtaining a smooth electromotive-force curve in alternate-current dynamos." SIEMENS BROS. DYNAMO WORKS, LTD., and M. KLOSS. June 9th.

12,398. "Improvements in or relating to installations of electric lamps having metal filaments." W. DIERMAN. June 9th.

12,430. "Improvements in or relating to telemotor apparatus for ships' steering gear, telegraphs, indicators and the like." W. J. PAULIN and T. C. FORTUNE. June 9th. (Complete.)

12,431. "Improvements in and relating to cut-out valves." G. H. WILSON and W. A. MOON. June 9th. (Complete.)

12,447. "Improvements in or relating to electric motors for vehicles." C. R. MASSOME. June 9th. (Complete.)

12,468. "Improvements in apparatus for wireless telegraphy." J. SAHULKA. June 10th. (Complete.)

12,470. "New or improved adapter for electric incandescence lamps." F. L. WRIGHT. June 10th.

12,498. "Improvements relating to the control of electric motors." H. A. MAVOR and MAVOR & COULSON, LTD. June 10th.

12,507. "Improvements in telephonic or like calling apparatus." C. H. ELLISON and C. M. JACOBS. (Application for Patent of Addition to No. 18,308/07.) June 10th.

12,508. "Improvements in motor-controlled switches." A. J. BARLOW. June 10th.

12,519. "Improved plug or holdfast for use in fixing gas fixtures, telephones, mantles, shelves, bolt-ends, stanchions and all such like articles that require fixing to withstand strains." J. TAYLOR. June 11th.

12,527. "Improvements in and relating to variable-motion gear for actuating magnetos, dynamos, and the like for electric ignition and other purposes." E. EUGENE-BROWN. June 11th.

12,531. "Improvements in electrically-driven percussive tools." J. KNIGHT and P. R. KEPPIE. June 11th.

12,532. "Improvements in electrically-operated pumps or the like." J. KNIGHT and P. R. KEPPIE. June 11th.

12,556. "Improvements in carbons for arc lamps." SIEMENS BROS. DYNAMO WORKS, LTD. (Siemens-Schuckertwerke G.m.b.H., Germany.) June 11th. (Complete.)

12,563. "Improvements relating to the electric ignition systems of internal combustion engines." R. F. HALL. June 11th.

12,567. "Improvements in electric bells." C. HERRDE. June 11th.

12,580. "Improvements in and relating to alternating-current motors of the commutator type." BRITISH THOMSON-HOUSTON CO., LTD. (General Electric Co., United States.) June 11th. (Complete.)

12,592. "Improved push switch lamp-holder for electric light fittings." G. H. IDE. June 12th.

12,614. "Improvements in means for electrically-operating tramway points, switches and the like." R. HACKING and H. W. HILL. June 12th.

12,630. "Pocket electric lamp." P. M. E. BOURGEOIS and C. H. BOURGEOIS. June 12th. (Complete.)

12,634. "Improvements in or relating to electrical conductors." C. A. KELLER. June 12th. (Complete.)

12,644. "Improvements in and relating to electric arc lamps." J. O. GIRDLESTONE and C. F. G. THORKELIN. June 12th. (Complete.)

12,650 "Improvements in electric motors." JOHNSON & PHILLIPS, LTD., and S. PATERSON. June 12th.

12,651. "Improvements in electric arc lamps." JOHNSON & PHILLIPS, LTD., and S. PATERSON. June 12th.

12,654. "Improvements in electric lamps." THE LONDON IMPORT CO., LTD., and B. PORDES. June 12th.

12,656. "Improvements in and relating to arc lamps." D. TIMAR and C. von DREGER. (Date applied for under Sec. 91 of the Act, July 8th, 1907, being date of application in Germany.) (Complete.)

12,678. "Improved electric cut-out." G. GAGLIO & L. VILLANI. June 12th. (Complete.)

12,682. "Improvements in and relating to arc lamps." ALLGEMEINE ELEKTRICITATS GES. (Date applied for under Sec. 91 of the Act, July 15th, 1907, being date of application in Germany.) June 12th. (Complete.)

12,684. "Improvements in and relating to electromagnetic relays, especially applicable to the control of electric motors." THE BRITISH THOMSON-HOUSTON CO., LTD. (General Electric Co., United States.) (Application for patent of addition to No. 16,195/06.) June 12th.

12,689. "Improved construction of tumbler switch." W. J. CHARLES. June 13th.

12,690. "Improvements in electric cables or wire conduits and the like." H. S. SMITH. June 13th.

12,704. "Improved method of and apparatus for controlling the voltage of dynamo-electric machinery especially applicable to variable speed generators." W. STANSFIELD and J. J. HATT. June 13th.

12,720. "Improvements in the manufacture of incandescent electric lamp filaments, and in apparatus therefor." SOCIETE FRANCAISE D'INCANDESCENCE PAR LE GAZ (SYSTEME AUER). (Date applied for under Sec. 91 of the Act, July 13th, 1907, being date of application in France.) June 13th. (Complete.)

12,736. "Improved method of and means for adjustably suspending electric incandescent lamps." C. E. HELDBEK. June 13th.

12,738. "Improvements in and relating to electromagnetic power-velocity ratio devices particularly applicable for driving automobiles and the like." A. H. MIDGLEY and C. A. VANDERVELL. June 13th.

PUBLISHED SPECIFICATIONS.

Copies of any of these Specifications may be obtained of Messrs. W. P. THOMPSON & Co., 322, High Holborn, W.C., and at Liverpool and Bradford; price, post free, 9d. (in stamps).

1907.

ELECTRIC MOTOR CONTROLLERS. E. Schattner. 8,842. April 16th.

ALTERNATE-CURRENT MOTORS. V. A. Fynn. 11,288. May 14th.

TELEPHONIC DICTATING SYSTEM AND DEVICES. W. G. Heys. (General Acoustic Co., United States.) 11,317. May 15th.

ELECTRICALLY-OPERATED OR CONTROLLED WHISTLES OR SOUND SIGNALLING APPARATUS. W. J. W. Bruce. 11,352. May 15th.

ELECTRIC SWITCHES. J. H. Tucker, trading as J. H. Tucker & Co. 11,459. May 16th.

ELECTRO-DEPOSITION OF METALS. S. O. Cowper-Coles. 11,471. May 16th.

ELECTRIC SWITCHES. J. H. Tucker, trading as J. H. Tucker & Co. 11,520. May 17th.

RADIO-TELEPHONY. Amalgamated Radio-Telegraph Co. (G. Seibt, Germany.) 11,696. May 18th.

CONTROL OF ELECTRIC MOTORS. J. G. V. Lang. 11,794. May 21st.

TELEPHONIC APPARATUS. E. A. Graham. 11,808. May 21st.

COMBINED ELECTRICAL AND MECHANICAL SYSTEMS FOR THE STORAGE OF POWER. Siemens Bros. Dynamo Works and H. B. Poynder. 11,874. May 22nd.

SYSTEMS FOR ELECTRICALLY OPERATING RAILWAY SIGNALS, POINTS AND THE LIKE. British Thomson-Houston Co. (Allgemeine Elektricitäts Ges., Germany). 12,238. May 27th.

ELECTRIC AMPEREMETERS, VOLTMETERS AND THE LIKE. A. Lehmann. 12,368. May 28th.

METHODS OF PRODUCING ELECTRIC OSCILLATIONS. R. C. Galletti. 12,633. May 31st. (Date applied for under International Convention, January 29th, 1907.)

"ELECTRICAL REVIEW

	Place.	Supply Authority.	Year of opening.	Engineer.	Pressure of supply, volts.	Frequency and phase.	Total capacity of plant in KW.	Max. load recorded in KW.	Storage battery, max. discharge.	Total capital expended.	Private lighting, eqvt. 8 c.p. lamps.	Public lighting
1	ABERDEEN	Aberdeen Corporation ..	1894	J. Alex. Bell ..	220 & 440* (Cults 230)	Direct ..	4,610	2,912	420 KW.	£283,967	186,392 (4,546 KW.)	306 arc
2	ABERYSTWYTH ..	Chiswick Electricity Supply Corporation, Ltd.	1895	E. P. Perkins ..	220 & 440	Direct ..	420	220	35 KW.	..	13,840 (461 KW.)	29 arc, 2
3	ACCRINGTON	Accrington Corporation ..	1900	Harold Gray ..	230 & 460	Direct ..	888	758	160 KW.	£53,045	22,230 (741 KW.)	18 arc, Nernst
4	ACTON	Acton Urban District Council	1905	J. Martin Blair	230 & 460	Direct ..	780* (mtr.-gen.)	256	1,000 A.H.	£60,293	23,019 (770 KW.)	64 arc, 128
5	ALDERLEY EDGE AND WILMSLOW	Alderley & Wilmslow Electric Supply Ltd.	1899	F. Garside ..	210 & 420	Direct ..	242	116	33.6 KW.	£45,727	11,809 (395 KW.)	235 Nerns
6	ALDERSHOT TOWN ..	Aldershot Urban District Council	1902	Cuthbert W. Bentley	210 & 420	Direct ..	440	209	150 A.	£26,500	..	18 arc, 10 i 18 N., 17
7	ALLOA	Alloa Corporation	1902	J. W. Napier ..	220 & 440	Direct ..	..	98·5	270 A.	£9,500	7,950 (255 KW.)	20 arc
8	ALNWICK	Northern Counties Electricity Supply Co., Ltd.	1902	J.W. Summerside	230 & 460	Direct ..	150	104	300 A.H.	£12,000	..	..
9	ALTRINCHAM & DIST.	Altrincham Electric Supply Ltd.	1895	H. C. Caldwell ..	100	80~, 1-ph.	660	434	..	£65,081	..	..
10	ASCOT, SUNNINGHILL & SUNNINGDALE	Ascot District Gas and Electricity Committee	1907	A. E. Brooks ..	220 & 440	Direct ..	100	20	57 KW.	..	3,120 (104 K.W.)	..
11	ASHTON-U-LYNE ..	Ashton Corporation	1899	N. Appelbee ..	240 & 480 tr. 500	Direct ..	1,760	1,273	..	£34,632	25,088 (836 KW.)	98 arc, 137 1 N., 20
12	ASTON MANOR ..	Aston Manor Corporation ..	1903	R. Foster ..	230 & 460 tr. 500	Direct ..	2,235	821	..	£108,000	28,285 (943 KW.)	19 arc, 30 i
13	ATHERTON	Atherton Urban Dist. Council	1903	Chas. T. Astbury	240 A.C., 500 D.C.	50~, 2-ph. & direct	300*	56	..	£10,000	3,040 (101 KW.)	12 arc
14	AYR	Ayr Corporation	1896	Roland Marshall	100 & 200 A.C. 250 & 500 D.C.	60~, 1-ph., & direct	1,325	750	100 KW.	£96,226	47,487 (1,583 KW.)	111 arc, 2 cbn.
15	BANBURY	Banbury & District Electric Supply Co., Ltd.	1903	Arthur J. Wray	230 & 460	Direct ..	632	170	100 KW.	..	7,889 (263 KW.)	..
16	BANGOR (WALES) ..	Bangor Corporation	1900	P. F. White ..	230 & 460	Direct ..	440	192	84 KW.	£29,254	11,560 (385 KW.)	..
17	BARKING	Barking Urban District Council	1899	H. L. Howard ..	230 & 460	Direct ..	1,010	478	..	£30,000	13,827 (461 KW.)	19 arc, 494 i 94 Nerns
18	BARNES, MORTLAKE & EAST SHEEN	Barnes Urban District Council	1901	C. S. Davidson..	210 & 420	Direct ..	970	451	300 KW.	£63,647	33,679 (1,122 KW.)	1 arc, 24 mt 391 Nern
19	BARNSLEY	Barnsley Corporation.. ..	1900	E. A. Barker ..	230 & 460	Direct ..	1,375	869	150 KW.	£76,050	50,375 (1,679 KW.)	109 arc, 1 inc., 250 m
20	BARNSTAPLE	Barnstaple Corporation ..	1903	J. W. Hadfield..	230 & 460	Direct ..	375	220	41.4 KW.	£31,600	13,500 (450 KW.)	30 arc, 148 c 8 mtl., 24
21	BARROW- IN-FURNESS	Barrow-in-Furness Corporation	1899	H. R. Burnett ..	220 & 440 tr. 500	Direct ..	1,525	892	300 KW.	£110,872	47,637 (1,490 KW.)	66 arc, 143 i N. & mtl
22	BATH	Bath Corporation	1899	Francis Teague	100 A.C., 220 D.C.	100~ 1-ph., & direct	1,900	1,072	350 KW.	£159,424	58,291 (1,943 KW.)	194 arc, 5 ch
23	BATLEY	Batley Corporation	1903	S. D. Jones ..	220 & 440	Direct ..	850	596	90 KW.	£42,077	9,785 (335 KW.)	25 arc, 50 in
24	BECKENHAM	Beckenham Urban District Council	1900	J. E. Tapper ..	200 & 400	50~, 1-ph.	550	310	..	£62,552	2),447 (681.5 KW.)	17 arc, 33 in
25	BEDFORD	Bedford Corporation	1894	R. W. L. Phillips	105 & 210	60~, 1-ph.	830	560	..	£34,204	53,000 (1,767 KW.)	17 arc, 616 i
26	BELFAST	Belfast Corporation	1895	Thos. W. Bloxam	220 & 440 tr. 550	Direct ..	8,800	6,217	100 A.	£305,740	173,251 (5,775 KW.)	4 arc
27	BERWICK-UPON-TWEED	Urban Electric Supply Co., Ltd.	1903	J. Hayward Home	240 & 480	Direct ..	180	141	93 KW.	£29,300	9,724 (324 KW.)	17 arc, 34 cb 8 Nernst
28	BEXHILL-ON-SEA ..	Bexhill Corporation	1900	W. T. Le Feuvre	220 & 440	Direct ..	1,150	442	23 KW. for 10 hrs.	£61,000	35,315 (1,177 KW.)	53 arc, 374 cb 220 mtl.
29	BEXLEY	Bexley Urban District Council	1903	C. Mittelhausen	200 A.C., tr. 500 D.C.	50~, 1 ph.	450 A.C. 300 D.C	95 lg., 198 tr.	137 KW.	Lg. £17,258 tr. £91,237	5,815 (194 KW.)	155 inc., 10 Nernst
30	BIRKDALE	Birkdale District Electric Supply Co., Ltd.	1902	H. Bentham ..	230 & 460	Direct ..	390	320	80 KW.	£33,217	24,025 (800 KW.)	248 cbn., 50 N.
31	BIRKENHEAD	Birkenhead Corporation ..	1898	W. Wyld ..	230 & 460	Direct ..	1,750	852	208 KW.	£137,450	86,211 (2,583 KW.)	58 arc
32	BIRMINCHAM	Birmingham Corporation ..	1891	R. A. Chattock..	220 & 440 tr. 550*	Direct ..	14,956	7,137 l. &p. 3,838 tr.	1,150 KW.	£1,205,000	294,878 (9,829 KW.)	..
33	BLACKBURN	Blackburn Corporation ..	1895	P. P. Wheel-wright	110, 220 A.C., 220 & 440 D.C.	50~, 1-ph., & direct	4,518	2,400	200 KW.	£232,867	90,555 (3,018 KW.)	207 arc, 47 cbn.
34	BLACKPOOL	Blackpool Corporation ..	1893	Charles Furness	200 A.C., 500 D.C.	83~, 1-ph., & direct	4,450	2,602	175 KW.	£199,000	*	278 arc, 46 cbn., 232 N
35	BLYTH & COWPEN ..	Northern Counties Electric Supply Co., Ltd.	1901	C.W. Fairweather	230 & 460	Direct ..	600	215	40 KW. for 5 hrs.	£45,365	14,693 (490 KW.)	..
36	BOLTON	Bolton Corporation	1894	A. A. Day ..	100 & 200 A.C.* 230 & 460 D.C.	83~, 1-ph.,* & direct	7,600	..	..	£325,987	149,784 (4,991 KW.)	..
37	BO'NESS	National Electric Construction Co., Ltd. (for the Corporation)	1905	H. G. Young ..	230 & 460	Direct ..	200	123	240 KW.	..	2,500 (83 KW.)	30 arc, 12 twin cbn., 23
38	BOOTLE	Bootle Corporation	1899	T. Dawson Clothier	220 & 440 tr. 500	Direct ..	2,050	..	150 KW.	£111,521	39,583 (1903)	174 arc, 150 cb 508 mtl., 45
39	BOURNEMOUTH ..	Bournemouth Corporation ..	1902	I. Bulfin ..	550	Direct ..	1,300	1,000	..	£316,948 inc. tr.	..	132 arc
40	BOURNEMOUTH, POOLE AND CHRISTCHURCH	Bournemouth & Poole Electric Supply Co., Ltd.	1889	E. Ll. Ingram ..	100 & 200 A.C.* 250 & 500 D.C.	100~, 1-ph., & direct	4,160	2,189	355 KW.	£330,168	169,722 (5,657 KW.)	8 mtl., 124 N
41	BRADFORD	Bradford Corporation ..	1889	Thomas Roles ..	230 & 460 tr. 500	Direct* ..	1,500 A.C. 8,180 D.C.	6,087	230 KW. lg. 250 KW. tr.	£774,800 approx.	180,387 (6,013 KW.)	72 arc, 14 cbn
42	BRAY	Bray Urban District Council	1892	W. J. U. Sowter	100 & 200	60~, 1-ph.	320	125	..	£17,000	11,000 (366 KW.)	32 arc, 200 cbn 30 mtl.
43	BRECHIN	North of Scotland Electric Light & Power Co., Ltd.	1901	Ernest Ames (res.)*	240 & 480	Direct ..	282	102.8	..	£34,074	12,118 (404 KW.)	351 cbn., 5 N
44	BRIDGEND	Bridgend Urban District Council	1903	T. Thomas ..	200	60~, 2-ph.	300*	100	..	£7,386	4,413 (147 KW.)	15 arc, 363 in
45	BRIDGWATER	Bridgwater & District Electric Supply & Traction Co., Ltd.	1904	Harold Walker..	230 & 460	Direct ..	200	70	49 KW.	£28,398	5,000 (167 KW.)	15 arc, 184 inc.
46	BRIDLINGTON ..	Bridlington Corporation ..	1905	Arthur J. Beckett	220 & 440	Direct ..	440	360	480 A.H.	£34,207	17,813 (595 KW.)	39 arc, 117 cbn 300 mtl., 21
47	BRIGHOUSE	Brighouse Corporation ..	1898	A. Aspinall ..	110	Direct ..	70	44	32 KW.	£4,674	3,930 (129 KW.)	..
48	BRIGHTON	Brighton Corporation ..	1891	A. Wright (Con.) J. Christie (Man.)	115, 230, & 460 ; tr. 550	Direct ..	7,200	3,894 lg. 750 tr.	400 A.H. lg. 1200 A.H. tr.	£740,000 approx.	..	372 arc, 3,52 cbn.* 350 mtl
49	BRISTOL	Bristol Corporation	1893	H. Faraday Proctor	105 & 210 A.C. 250 & 500 D.C.	93~, 1-ph.* & direct	9,050	5,378	70 KW.	£716,937 (approx.)	212,681 (7,089 KW.)	693 arc, 9 inc
50	BROMLEY (KENT) ..	Bromley (Kent) Electric Light & Power Co., Ltd.	1898	R. R. Barker ..	210	Direct ..	1,620	690	68 KW.	£128,344	59,201 (1,975 KW.)	3 N.
51	BROUGHTY FERRY ..	Broughty Ferry Corporation	1902	J. L. Turnbull ..	230 & 460	Direct ..	150	84	250 KW.	£18,959	12,939 (431 KW.)	12 arc, 36 cbn 4 mtl.
52	BUCKINGHAM	Buckingham Electric Light Co.	1889	T. Gillies (Man.)	220	Direct ..	70	40	..	..	1,600 (53 KW.)	70 cbn., 20 N
53	BUNCRANA	Buncrana Electric Supply Co.	1905	John K. Swan ..	235 & 470	Direct ..	125	..	..	..	..	arc, 30 cbn.
54	BURGESS HILL	Burgess Hill & District Electric Supply Co., Ltd.	1903	W. Simms ..	230	Direct ..	64	50	..	£4,000	2,500 (83 KW.)	5 arc, 19 inc. 4 Nernst
55	BURNLEY	Burnley Corporation ..	1898	Jas. E. Starkie..	110, 220 & 440 tr. 500	Direct ..	1,990	1,661	66 KW. lg. 250 KW. tr.	£94,761	49,616 (1,486.5 KW.)	3 arc, 12 cbn
56	BURSLEM	Burslem Corporation	1905	Ashton Bremner	220 & 440	Direct ..	650	320	70 KW.	£30,000	12,330 (411 KW.)	20 arc, 40 inc
57	BURTON-ON-TRENT ..	Burton-on-Trent Corporation	1894	P. J. Pringle ..	100 & 200 A.C. 500 D.C. (tr.)	75~, 1-ph. & direct	1,710	515 lg. 375 tr.	..	£81,471	31,775 (1,059 KW.)	1 arc
58	BURY (LANCS.) ..	Bury Corporation	1896	S. J. Watson ..	220 & 440 tr. 500	Direct ..	2,260	1,675	154 KW. lg. 225 KW. tr.	£91,492	36,711 (1,224 KW.)	86 arc, 18 × 2 inc.
59	BURY ST. EDMUNDS ..	Bury St. Edmunds Corporation	1900	S. E. Day ..	200 & 400	Direct ..	282	193	240 KW.	£28,643	9,600 (320 KW.)	14 arc, 381 cbn 34 mtl., 21 N
60	BUXTON	Buxton Urban District Council	1900	W. J. Leeming..	230	Direct ..	590	355	..	£44,327	..	90 arc
61	CAMBORNE, REDRUTH AND ILLOGAN	Urban Electric Supply Co., Ltd.	1902	L. A. Hards ..	240 & 480 tr. 550	Direct ..	1,025	540	200 KW. lg. 200 KW. tr.	£56,297	10,140 (338 KW.)	2 arc, 187 cbn
	.. ..	Cambridge Electric Supply Co., Ltd.	1892	H. B. Harvey ..	200	90~, 1-ph.	2,000	714	..	£134,602	51,181 (1,706 KW.)	1 arc

IEW" LIST OF ELECTRICITY

Private lighting, eqvt. 8 c.p. lamps.	Public lighting.	No. and H.P. of private motors.	No. and H.P. of traction motors.	Total connections of all kinds.	Percentage increase during year.	Price charged per unit, pence.	System of charging.	Units sold during last complete year.	Remarks.	
186,392 (4,546 KW.)	306 arc ..	598=3289 H.P.	160=4,000 H.P.	7,840.3 KW. (ex. tr.)	18	Lg. 5½ & 1½; pb. lg. 5½ & 1½; pr. 2½ & 1; tr. 1.1011.	Max. demand, flat rate and contract	4,794,507	Lg. & tr. stn. *Traction 500 v. Supply being extended into two counties. Data to July 31, 1907.	1
13,840 (461 KW.)	29 arc, 2 mtl.	20 H.P. ..	..	492.3 KW.	7.1	Lg. 6 w. dis. to 25%; pb. lg. arc. £13 13s. p.a.; pr. 2 & 2½ ..	Flat rate with dis.	140,257	Data to Dec. 31, 1907	2
22,230 (741 KW.)	18 arc, 60 Nernst	207=683 H.P.	..	1,474 KW.	..	Lg. 4 w. dis.; pb. lg. 3; pr. 3 & 1	Flat rate with discounts	804,293	Data for 1906-7	3
23,019 (770 KW.)	64 arc, 128 inc.	31=162 H.P.	..	860.5 KW.	..	Lg. 5 & 4½; pb. lg. 4; pr. 2, or 3 & 1	Sliding scale & max. demand	368,518	*Supply in bulk at 10,000 volts A.C. from Met. Elec. Supply Co.	4
11,809 (395 KW.)	235 Nernst	10=37½ H.P.	..	501 KW.	..	Lg. 7 & 4, or 6; pb. lg. 28/-(½a.), 38/-(½a.); pr. 4 & 1½, or 2½	Max. demand and flat rate	110,046	.. ..	5
..	18 arc, 10 inc., 18 N., 17 mtl.	23=60 H.P.	..	430 KW.	..	Lg. 6 & 4, or 5; pb. lg. 2½; pr. 3 & 2	Max. demand and flat rate	200,139	.. ..	6
7,950 (235 KW.)	20 arc ..	16=24 H.P...	..	296.4 KW.	..	Lg. 4; pb. lg. 2½; pr. 2	Flat rate	83,951	Bulk supply from British Electric Plant Co.	7
..	..	..	..	430 KW.	..	Lg. 5½ to 4; pr. 2½ to 1½ ..	Sliding scale ..	..	.. ..	8
..	..	9=44 H.P...	..	1,922 KW.	6.7	Lg. 6; pr. 3	Flat rate and contract	484,371	Data to Dec. 31, 1907	9
3,120 (104 K.V.)	..	..	..	104 KW. ..	..	Lg. 7 & 5; pr. 4 & 3	Flat rate with dis.	..	Data to May, 1908	10
25,043 (836 KW.)	93 arc, 120 inc. 1 N., 20 mtl.	77=280 H.P.	180=3,000 H.P.	3,644 KW.	..	Lg. 3½ to 2½ (2-rate, 1d.); pb. lg. 1.6; pr. 1.5 to 0.9; tr. 1.5 to 1.0	Sliding scale, 2-rate meter & contract	2,239,347	Lighting and traction. Energy supplied to four tramway undertakings	11
28,283 (943 KW.)	19 arc, 30 inc.	50=974½ H.P.	36=2,000 H.P.	3,530 KW.	..	Lg. 8½ to 2½, or 6 & 1½*; pr. 2 to 1; tr. 1½	Sliding scale and 2-rate meter	2,114,364	Lighting and traction. *Pb. lg. arc £12 p.a.	12
3,040 (101 KW.)	12 arc ..	16=104 H.P.	..	200 KW.	..	Lg. 5; pr. 1½	Flat rate	41,424	*Supply in bulk at 7,000 v. A.C. from South Lancs. Traction & Power Co.	13
47,487 (1,583 KW.)	111 arc, 201 cbn.	61=203.5 H.P.	32=800 H.P.	2337.7 KW.	5.6	Lg. 3½; pb. lg. 2; pr. 2 to 1½; tr. 1.3	Flat rate	1,268,021	Lighting and traction. Data to May 15, 1907	14
7,889 (233 KW.)	..	25=153 H.P.	..	436.3 KW.	7.3	Lg. 7 & 2½ (4½ max. average); pr. 1½	Max. demand and flat rate	139,889	Data to Dec. 31, 1907	15
11,560 (385 KW.)	..	17=92 H.P.	..	458 KW.	..	Lg. 5; pr. 2½ to 1¾	Flat rate & sliding scale	155,304	.. ..	16
13,827 (461 KW.)	19 arc, 494 inc., 64 Nernst	61=493 H.P.	24=600 H.P.	1,476.5 KW.	..	Lg. 4½; pb. lg. 1.99; pr. 3½ to 1; tr. 1½	Flat rate & sliding scale	769,089	Lighting and traction	17
33,679 (1,122 KW.)	1 arc, 24 mtl., 391 Nernst	6)=592 H.P.	..	1,723 KW.	13	Lg. 4 w. dis. to 25%; pb. lg. 1.6; pr. 1½ w. dis. to 33⅓%	Sliding scale with dis.	868,942	Data to March 31, 1908	18
50,375 (1,679 KW.)	109 arc, 103 inc., 250 mtl.	118=350 H.P.	..	2,114 KW.	8.5	Lg. 3½; pb. lg. 7 & 1½; pr. 1½	Flat rate	1,363,599	Data to Mar. 31, 1908	19
13,500 (450 KW.)	30 arc, 148 cbn. 8 mtl., 24 N.	25=65 H.P.	..	496 KW.	25	Lg. 5; pb. lg. 5; pr. 2, 2½, & 3..	Flat rate with discounts	170,063	Data to Mar. 31, 1908	20
47,637 (1,435 KW.)	66 arc, 143 inc. N. & mtl.	137=344 KW.	32=752 H.P.	2,752 KW.	8	Lg. 6 & 3, or 4½ & 4*; pr. 3 & 1, or 2 to 1½ (day 1); tr. 2 to 1½	Max. dem., flat rate, sl. sc., and 2-rate	1,047,776	Lighting and traction. *Pb. lg. arc £17½, inc. £3 and £2½. Data to Mar. 31, 1908	21
58,231 (1,943 KW.)	194 arc, 5 cbn.	125=400 H.P.	..	2,423 KW.	8.3	Lg. 5; pb. lg. arc £24, inc. £6; pr. 1½	Flat rate & two-rate mtr., & contract.	1,468,535	Supply by company 1890-7. Data to March 31, 1908 ..	22
9,785 (326 KW.)	25 arc, 50 inc.	53=230 H.P.	32=1,173 H.P.	1,463 KW.	..	Lg. 6 & 2; pb. lg. arc £16; pr. 3 & 1; tr. 1½	Max. demand & flat rate	733,436	Lighting and traction. Data for 1906-7	23
2,447 (681.5 KW.)	17 arc, 35 inc.	5=13 H.P. ..	..	1,181 KW.	..	Lg. 5* ; pb. lg. arc £20 p.a. ; pr. 2 & 1½	Flat rate	377,583	*Free wiring 6d. per unit	24
53,000 (1,767 KW.)	17 arc, 616 inc.	137 H.P. ..	..	1,933 KW.	..	Lg. 5½; pr. 1	Flat rate	911,000	.. ..	25
173,251 (5,775 KW.)	4 arc ..	4,135 H.P. ..	464=13,920 H.P.	9,818 KW.	8.7	Lg. 5½ & 1¾, or 3½; pr. 2½ & 1, or 1 flat w. time-switch.*	Max. demand & flat rate	10,883,658	Lg. & traction. 3-phase 50~ to substns. at 6,000 v. *Pb. lg. arc £15 p.a. Data to March 31, 1908	26
9,724 (324 KW.)	17 arc, 34 cbn., 8 Nernst	51=239 H.P.	..	533 KW. ..	17.3	Lg. 6 & 3; pb. lg. arc £17 p.a.; pr. 4 & 1½	Max. dem., flat rate, 2-rate mtr. & cont.	174,818	Data to December, 1907	27
35,315 (1,177 KW.)	53 arc, 374 cbn., 220 mtl.	30=82 H.P.	..	1,233 KW.	9.9	Lg. 7, 2 & 1½; pb. lg. arc £23, inc. £3 & £1.4; pr. 2*	Max. demand & flat rate	556,816	*Prept. meters 6d. per unit. Data to March 31, 1908 ...	28
5,815 (194 KW.)	155 inc., 103 Nernst	7=16½ H.P.	32=800 H.P.	..	..	Lg. 6; pr. 3 to 2 (day light), or 6 and 2	Flat rate	467,580	Lighting and traction. Bulk supply for lighting from tramway power station	29
24,025 (800 KW.)	248 cbn., 50 N.	5=19½ H.P.	6=105 H.P.	919 KW. ..	15	Lg. 4½; pb. lg., pr. & tr. 2 ..	Flat rate	314,109	Lighting and traction. Data to Dec. 31, 1907	30
86,211 (2,585 KW.)	58 arc ..	104=734 H.P.	..	3,235 KW.	19	Lg. 6. 3 & 1½, or 4; pb. lg. arc £18½; pr. 2 to 1	Max. dem., flat, sl. scale, 2-rate & cont.	1,154,327	Data to Mar. 31, 1908	31
294,878 (9,829 KW.)	..	1,550=9,497 H.P.	See other Table	18,545 KW. (ex. tr.)	31.3	Lg. 5 to 3½ (s.sl. 3 & 2); pr. 2 to 0.7 ; tr. 1½ to 1	Flat rate with discount	20,793,670	Lighting and traction. Data to March 31, 1908. *Three ph., 25~ at 50.0 v. to substns.	32
90,555 (3,018 KW.)	207 arc, 470 cbn.	491=3,035 H.P.	1,700 H.P. ..	6,986 KW.	10	Lg. 6 & 3, or 4; pb. lg. 1.7; pr. 1½ to 0.45; tr. 1.4	Max. dem., flat, sl. scale, 2-rate & t. sw.	4,142,011	Lighting and traction. Data to Mar. 25, 1908	33
..	278 arc, 464 cbn., 232 N.	136=867½ H.P.	122=2,214 H.P.	*	*	Lg. 6 & 2, or 5; pb. lg. 3 & 2½; pr. 3 & 1 (htg. 1); tr. 2 to 1½	Max. dem.,flat rate and sliding scale	3,051,217	Lg. and tr. *Cannot be stated, owing to general adoption of mtl. fil. lamps. Data to Mar. 31, 1908	34
14,893 (490 KW.)	..	834 H.P. ..	..	1,036.5 KW.	..	Lg. 4; pr. 2½ to 1½	Flat rate	207,933	.. ..	35
149,734 (4,991 KW.)	..	530=7,691 H.P.	See other Table	11,333 KW.	16	Lg. 3½ & 1, or 3½ less 10% ; pr. 2 to 1, less 10 per cent. ; tr. 1.1	Max. demand & flat rate	10,791,105	*Also three-phase supply at 400 v., 50~. Data to March 31, 1908	36
2,520 (83 KW.)	30 arc, 120 twin cbn., 23 N.	12=83 H.P.	..	412 KW. ..	..	Lg. 5; pb. lg. & pr. 2½	Flat rate and contract	..	Data to March, 1908	37
39,583 (1903)	174 arc, 150 cb., 508 mtl., 45 N.	1,379 H.P. (1906)	325 KW. ..	2,800 KW. (1903)	..	Lg. 6 & 1½, or 3½; pb. lg. 2; pr. 2 to 1; tr. 1½ to 1	Max. demand and flat rate	2,628,586	Lighting and traction	38
..	132 arc ..	..	..	..	..	Pb. lg. 2	Flat rate	..	Public lighting & traction. Private supply by company	39
169,722 (5,657 KW.)	8 mtl., 124 N.	135=316 H.P.	52=1,300 H.P.	6,993 KW.	29.7	Lg. 6; pr. 2 & 2½; tr. 1¾ ..	Max. dem., flat, sl. sc., 2-rate & cont.	2,860,534	Lighting and traction. *Also 400 A.C., and traction 550 D.C. Data to December 31, 1907	40
180,387 (6,013 KW.)	72 arc, 14 cbn.	1,445=6,818 H.P.	See other Table	12,333 KW. (ex. tr.)	5.4	Lg. 4 w. dis.†; pb. lg. arc £12½; pr. 2 to 1½; htg. 2; tr. 1½	Flat rate and max. demand	15,115,000 (approx.)	Lg. & tr. Lamps free (one p. 30 u.). *50~3-ph. at 6,600 v. to substns. †Also 7d. & 1d. m. d. Data to 31/3/08	41
11,000 (366 KW.)	32 arc, 200 cbn., 30 mtl.	..	..	395 KW. ..	3.95	Lg. & pr., 6 & 3½; pb. lg., arc £15, inc. £3 p.a.	Max. demand ..	164,608	Extension under consideration. Data to March 31, 1908	42
12,118 (404 KW.)	251 cbn., 5 N.	21=136 H.P.	..	546 KW. ..	3	Lg. 6 & 4, or 5½; pb. lg. 2.9; pr. 4 & 1½, or 2½	Max. dem., flat rate, 2-r. & cont.	113,265	* F. Barritt Hills, Engineer & Manager	43
4,413 (147 KW.)	15 arc, 368 inc.	8=30 H.P...	..	203 KW.	..	Lg. 4½ & 4; pb. lg. 2.8; pr. 1½; htg. 2½	Flat rate	96,690	* Energy purchased in bulk from S. Wales E. P. D. Co. at 1.375d. per unit	44
5,000 (167 KW.)	15 arc, 184 inc.	10=21 H.P.	..	183 KW.	..	Lg. 7 & 2, or 4½; pr. 3 & 1, or 2	Max. demand & flat rate	41,000	.. ..	45
17,813 (535 KW.)	39 arc, 117 cbn., 300 mtl., 21 N.	21=75 H.P.	..	600 KW.	38	Lg. 5 to 3½; pb. lg. arc £15, N. £5, inc. £5, £4 & £3; pr. 2 to 1½	Sliding scale ..	256,583	Data to Mar. 31, 1908	46
3,880 (129 KW.)	..	16=40 H.P.	..	133 KW.	19	Lg. 5; pr. 4, 3 & 2	Flat rate	45,097	Gas power. Data to Mar. 31, 1908	47
..	372 arc, 3,528 cbn.* 350 mtl.	364=1,425 H.P.	80=2,400 H.P.	10,320 KW.	5	Lg. 6 & 2, or 4, 3; pb. lg. 1½; pr. 1½ (t. sw. l.); tr. 1½	Max. dem., flat, sl. scale & t. switch	8,000,000	Lg. & tr. Old plant shut down; new works supply H.T. 3 ph. 50~ to substs. Data to Mar. 31, '08. *Conv. to mtl. fil.	48
212,681 (7,089 KW.)	693 arc, 9 inc.	5,805 H.P. ..	..	12,185 KW.	..	Lg. 4½ to 3 w. dis.; pb. lg. arc £14½ & £21; pr. 1½ & ¾ w. dis.	Lg. 2-rate meter, pr. m. d. & flat	6,202,571 (approx.)	*Also 50~, 3-phase, at 210 volts	49
59,201 (1,975 KW.)	3 N.	45=112 H.P.	..	2,600 KW.	10	Lg. 7 & 4, or 6; pr. 4 & 1, or 2½	Max. demand, flat rate & 2-r. mtr.	792,938	Bulk supply to Chislehurst at 2,000 volts D.C. Data to Dec. 31, 1907	50
12,939 (431 KW.)	12 arc, 36 cbn. 4 mtl.	15=54 H.P.	..	491 KW.	8.5	Lg. 6; pb. lg. 2½; pr. 4	Flat rate	122,715	Data to May 15, 1908	51
1,600 (53 KW.)	70 cbn., 20 N.	2=1½ H.P. ..	..	67 KW. ..	..	Lg. 7 w. dis.; pb. lg. contract ..	Flat rate	..	Part gas power	52
..	6 arc, 30 cbn.	35 H.P. ..	..	..	..	Lg. 5; pb. lg. contract; pr. 1½..	Flat rate with discount	..	.. ..	53
2,500 (83 KW.)	5 arc, 19 inc., 4 Nernst	4=10 H.P. ..	..	97 KW.	..	Lg. 6; pr. 5	Flat rate	25,000	Suction gas power; overhead mains	54
49,646 (1,488.5 KW.)	3 arc, 12 cbn.	165=527½ H.P.	46=3,460 H.P.	4,482.5 KW.	12.8	Lg. 3½; pb. lg. 1½; pr. 1½ & 1; tr. 1½	Flat rate & max. demand	3,434,979	Lighting and traction. Data to Mar. 31, 1908	55
12,330 (411 KW.)	20 arc, 40 inc.	..	74=358 H.P.	..	..	Lg. 7 & 2, or 5; pb. lg. 3; pr. 2 to ½	Max. demand & flat, pr. sl. scale	333,881	Data to Dec. 21, 1907	56
31,775 (1,059 KW.)	1 arc ..	112=737 H.P.	40=1,000 H.P.	1,671 KW.	19.0 (ex. tr.)	Lg. 5, or 6 & 3; pb. lg. 3; pr. 3 & 1, or 2 to 1½*; tr. av. 1.37	Max. demand, flat rate, & sl. scale	1,398,014	Lighting and traction. * Pr. 65.5% of total on restricted-supply hour, 1d. to ¾d. p. u. Data to Mar. 31, 1908	57
36,711 (1,224 KW.)	36 arc, 18×2 inc.	209=1,580 H.P.	See other Table	2,522 KW.	21.6	Lg. 4, 3½, 3; pb. lg. arc £12, £14, inc. £1½; pr. 2, 1, 0.7; tr. 1.05	Flat rate & sliding scale	3,004,403	Lighting and traction. Data to Mar. 31, 1908	58
9,600 (320 KW.)	14 arc, 381 cbn., 34 mtl., 21 N.	34=142 H.P.	..	478 KW.	9.5	Lg. 6; pb. lg. arc £14, inc. £2; pr. 3 to 2½*	Flat rate with discount	317,171	*Corp. waterworks, 50 H.P., supplied at 1.3d. per unit ..	59
..	30 arc ..	32=112 H.P.	..	893 KW. ..	..	Lg. 6, 4 & 3, or 7 & 3; pb. lg. arc £20 p.a.; pr. 3 & 1½	Max. dem., flat & sl. scale with dis.	315,139	Max. load in September; load through season heavier than in winter. Data to Mar. 31, 1908	60
10,140 (338 KW.)	2 arc, 187 cbn.	93=956 H.P.	20=500 H.P.	1,776 KW.	36	Lg. 7 & 4, or 6; pr. 4 & 1, or 2½; tr. 1½	Max. demand, flat rate & contract	1,254,239	Lighting and traction. Data to [illegible]	
51,181 (1,706 KW.)	1 arc ..	38=161 H.P.	..	1,855 KW.	5.5	Lg. 6 on 200 v., 7 on 100 v., with	Flat rate with dis-	655,743	Data to Dec. 31, 1907	

					tr. 550*			3,838 tr.			(9,839 kw.)			
33	BLACKBURN	Blackburn Corporation	1895	P. P. Wheel-wright	110, 220 A.C., 220 & 440 D.C.	50~, 1-ph., & direct	4,518	2,400	200 kw.	£352,867	90,555 (3,018 kw.)	207 arc, 470 cbn.		
34	BLACKPOOL	Blackpool Corporation	1898	Charles Furness	200 A.C., 500 D.C.	83~, 1-ph., & direct	4,450	2,602	175 kw.	£199,000	*	278 arc, 464 cbn., 232 N.		
35	BLYTH & COWPEN	Northern Counties Electric Supply Co., Ltd.	1901	C.W.Fairweather	230 & 430	Direct ..	630	215	40 kw. for 5 hrs.	£45,365	14,693 (430 kw.)	..		
36	BOLTON	Bolton Corporation	1894	A. A. Day	100&200 A.C.* 230 & 460 D.C.	83~, 1-ph.,* & direct	7,600	..	..	£325,987	149,734 (4,991 kw.)	..		
37	BO'NESS	National Electric Construction Co., Ltd. (for the Corporation)	1905	H. G. Young	230 & 460	Direct ..	200	128	240 kw.	..	2,530 (83 kw.)	30 arc, 120 twin cbn., 23 N.		
38	BOOTLE	Bootle Corporation	1899	T. Dawson Clothier	220 & 440 tr. 500	Direct ..	2,050	..	150 kw.	£111,531	39,583 (1903)	174 arc, 150 cb., 508 mtl., 45 N.		
39	BOURNEMOUTH	Bournemouth Corporation	1902	J. Bulfin	550	Direct ..	1,200	1,000	..	£316,948 inc. tr.	..	132 arc ..		
40	BOURNEMOUTH, POOLE AND CHRISTCHURCH	Bournemouth & Poole Electric Supply Co., Ltd.	1889	E. Ll. Ingram	100&200 A.C.* 250 & 500 D.C.	100~, 1-ph., & direct	4,160	2,189	355 kw.	£330,198	163,722 (5,657 kw.)	8 mtl., 134 N.		
41	BRADFORD	Bradford Corporation	1889	Thomas Roles	230 & 460 tr. 500	Direct* ..	1,500 A.C. 8,180 D.C.	6,087	230 kw. lg. 250 kw. tr.	£774,800 approx.	180,387 (6,013 kw.)	72 arc, 14 cbn.		
42	BRAY	Bray Urban District Council	1892	W. J. U. Sowter	100 & 200	60~, 1-ph.	320	125	..	£17,000	11,000 (356 kw.)	32 arc, 200 cbn., 30 mtl.		
43	BRECHIN	North of Scotland Electric Light & Power Co., Ltd.	1901	Ernest Ames (res.)*	240 & 480	Direct ..	282	102.8	..	£34,074	12,118 (404 kw.)	251 cbn., 5 N.		
44	BRIDGEND	Bridgend Urban District Council	1903	T. Thomas	200	60~, 2-ph.	300*	100	..	£7,286	4,418 (147 kw.)	15 arc, 368 inc.		
45	BRIDGWATER	Bridgwater & District Electric Supply & Traction Co., Ltd.	1904	Harold Walker	230 & 430	Direct ..	200	70	49 kw.	£23,393	5,000 (167 kw.)	15 arc, 184 inc.		
46	BRIDLINGTON	Bridlington Corporation	1905	Arthur J. Beckett	220 & 440	Direct ..	440	330	480 A.H.	£34,207	17,813 (535 kw.)	39 arc, 117 cbn., 300 mtl., 21 N.		
47	BRIGHOUSE	Brighouse Corporation	1898	A. Aspinall	110	Direct ..	70	44	22 kw.	£4,674	3,880 (129 kw.)	..		
48	BRIGHTON	Brighton Corporation	1891	A. Wright (Con.) J. Christie (Man.)	115, 230, & 460 ; tr. 550	Direct ..	7,200	3,894 lg. 750 tr.	400 A.H.lg. 1200 A.H.tr.	£740,000 approx.	..	372 arc, 3,528 cbn.* 350 mtl.		
49	BRISTOL	Bristol Corporation	1893	H. Faraday Proctor	105 & 210 A.C. 250 & 500 D.C.	93~, 1-ph.* & direct	9,050	5,378	70 kw.	£716,997 (approx.)	212,681 (7,089 kw.)	693 arc, 9 inc.		
50	BROMLEY (KENT)	Bromley (Kent) Electric Light & Power Co., Ltd.	1898	R. B. Barker	210	Direct ..	1,620	690	63 kw.	£128,344	59,201 (1,975 kw.)	3 N.		
51	BROUGHTY FERRY	Broughty Ferry Corporation	1902	J. L. Turnbull	230 & 460	Direct ..	150	84	250 kw.	£18,858	12,939 (431 kw.)	12 arc, 36 cbn. 4 mtl.		
52	BUCKINGHAM	Buckingham Electric Light Co.	1889	T. Gillies (Man.)	220	Direct ..	70	40	..	..	1,600 (53 kw.)	70 cbn., 20 N.		
53	BUNCRANA	Buncrana Electric Supply Co.	1905	John K. Swan	235 & 470	Direct ..	125	..	..	..	..	arc, 30 cbn.		
54	BURGESS HILL	Burgess Hill & District Electric Supply Co., Ltd.	1903	W. Simms	230	Direct ..	64	50	..	£4,000	2,500 (83 kw.)	5 arc, 19 inc., 4 Nernst		
55	BURNLEY	Burnley Corporation	1893	Jas. E. Starkie	110,220 & 440 tr. 500	Direct ..	1,990	1,661	66 kw. lg. 250 kw.tr.	£94,761	49,616 (1,488.5 kw.)	3 arc, 12 cbn.		
56	BURSLEM	Burslem Corporation	1905	Ashton Bremner	220 & 440	Direct ..	650	330	70 kw.	£30,000	12,339 (411 kw.)	20 arc, 40 inc.		
57	BURTON-ON-TRENT	Burton-on-Trent Corporation	1894	P. J. Pringle	100 & 200 A.C. 500 D.C. (tr.)	75~, 1-ph. & direct	1,710	515 lg. 375 tr.	..	£81,471	31,775 (1,059 kw.)	1 arc ..		
58	BURY (LANCS.)	Bury Corporation	1896	S. J. Watson	220 & 440 tr. 500	Direct ..	2,260	1,675	154 kw.lg. 225 kw.tr.	£91,492	36,711 (1,224 kw.)	86 arc, 18×2 inc.		
59	BURY ST. EDMUNDS	Bury St. Edmunds Corporation	1900	S. E. Day	200 & 400	Direct ..	282	193	240 kw.	£28,643	9,600 (320 kw.)	14 arc, 381 cbn., 34 mtl., 21 N.		
60	BUXTON	Buxton Urban District Council	1900	W. J. Leeming	230	Direct ..	590	355	..	£44,327	..	30 arc ..		
61	CAMBORNE, REDRUTH AND ILLOGAN	Urban Electric Supply Co., Ltd.	1902	L. A. Hards	240 & 480 tr. 550	Direct ..	1,025	540	200 kw.lg. 200 kw. tr.	£56,287	10,140 (338 kw.)	2 arc, 187 cbn.		
62	CAMBRIDGE	Cambridge Electric Supply Co., Ltd.	1892	H. B. Harvey	200	90~, 1-ph.	2,000	714	..	£124,692	51,181 (1,705 kw.)	1 arc ..		
63	CAMBUSLANG	Lanark County Council	1905	A. J. Abraham	250	Direct ..	200	104.4	58 kw.	£21,000*	3,276 (109 kw.)	30 arc, 510 mtl.		
64	CANTERBURY	Canterbury Corporation	1899	C. A. Blascheck	220 & 440	Direct ..	900	477	66 kw.	£35,001	21,152 (705 kw.)	12 arc, 227 cbn., 355 mtl.		
65	CARDIFF	Cardiff Corporation	1894	Arthur Ellis	100, 200 A.C., 200,400 D.C.*	40~, 1-ph.,† & direct	2,560 A.C. 1,100 m.g.	2,485	870 kw.	£260,000	841 (25 kw.)	612 arc, 112 cbn., 47 mtl.		
66	CARLISLE	Carlisle Corporation	1899	Sydney T. Allen	230 & 460, tr. 550	Direct ..	870	432 lg. 300 tr.	170 A. lg. 700 A. tr.	£63,325	31,277 (1,042 kw.)	52 arc, 20 mtl.		
67	CARLOW	J. Alexander	1899	O. St. J. McKee	100 & 200	70~, 1-ph., & direct	115	..	40 kw. for 4 hrs.	..	2,040 (68 kw.)	13 arc, 84 inc.		
68	CARNARVON	National Electric Construction Co., Ltd.*	1905	D. O. Evans	230 & 460	Direct ..	200	118	72 A.	..	..	..		
69	CATERHAM	Urban Electric Supply Co., Ltd.	1903	Henry Joseph	240 & 480	Direct ..	178	68	86·4 kw.	£33,849	8,959 (299 kw.)	..		
70	CHAGFORD	Chagford & Devon Electric Light Co., Ltd.	1891	Geo. H. Reed	100	99~, 1-ph.	22	19	..		..	..		
71	CHELMSFORD	Chelmsford Electric Lighting Co., Ltd.	1890	J. Eustace	100 & 200 A.C., 110 D.C	100~, 1-ph. & direct	960	388	..	£60,513	19,032 (634.5 kw.)	21 arc, 288 Nernst		
72	CHELTENHAM & CHARLTON KINGS	Cheltenham Corporation	1895	Walter J. Bache	100 & 200 tr. 550	100~, 1-ph., & direct	1,880	1,231	165 kw.	£154,076	58,910 (1,964 kw.)	388 arc, 19 inc.		
73	CHEPSTOW	Chepstow Electric Lighting & Power Co., Ltd.	1904	W. H. Scott	230	Direct ..	100	..	46 kw.	..	..	..		
74	CHESHAM	Chesham Electric Light & Power Co., Ltd.	1904	R.J.J.Swan(Res.)	230 & 430	Direct ..	250	150	100 A. for 2½ hrs.	£26,229	4,800 (160 kw.)	9 arc, 103 cbn., 20 mtl., 62 N.		
75	CHESTER	Chester Corporation	1896	S. E. Britton	210 & 420, tr. 500	Direct ..	1,300	1,200	235 kw.	£115,183	50,993 (1,700 kh.)	196 arc, 538 inc. 179 N., 11 mtl.		
76	CHESTERFIELD	Chesterfield Corporation	1901	R. L. Acland	240 & 480 tr. 500	Direct ..	1,000	817	150 kw.	£55,207	31,898 (1,063 kw.)	24 arc, 36 cbn., 12 mtl.		
77	CHISLEHURST	Chislehurst Electric Supply Co., Ltd.	1899	A. E. Darlington	210	Direct ..	220*	92	53 kw.	£26,806	13,129† (437 kw.)	..		
78	CHISWICK	Chiswick Electricity Supply Corporation, Ltd.	1900	A. W. Money	220 & 440	Direct ..	921	621	132 kw. hrs.	..	33,125 (1,104 kw.)	..		
79	CHURCH STRETTON	Church Stretton Electric Supply Co., Ltd.	1904	G. Payne	200 & 400	Direct .	100	..	..	..	..	..		
80	CLACTON-ON-SEA	Clacton-on-Sea Urban District Council	1903	H. W. Everitt	230 & 460	Direct ..	200	..	200 A. for 3 hrs.	£10,000	..	..		
81	CLECKHEATON	Cleckheaton Urban District Council	1902	A. Pickersgill	230 & 460 tr. 550	Direct ..	800	475	115 kw. hrs.	£26,260	..	3 arc, 6 mtl.		
82	COATBRIDGE AND AIRDRIE	Coatbridge and Airdrie Electric Supply Co., Ltd.	1894	J. A. Donachie	240 & 480	Direct ..	803	450	480 A.H.	..	30,197 (100·5 kw.)	22 arc, 214 inc.		
83	COLCHESTER	Colchester Corporation	1898	A. R. Sillar	210 & 420 tr. 500	Direct ..	2,080	886	..	£76,923	41,122 (1,383 kw.)	30 cbn., 8 mtl., 294 Nernst		
84	COLNE	Colne Corporation	1901	A. G. Cooper	240 & 480 tr. 540	Direct ..	770	448	..	£40,416	14,054 (468.5 kw.)	..		
85	COLWYN BAY	Colwyn Bay Urban District Council	1901	A. R. Tudman	220 & 440	Direct ..	420	300	44 kw.	£22,134	19,254 (642 kw.)	75 arc, 1 Nernst		
86	CORK	Cork Electric Tramways and Lighting Co., L'd.	1898	H. H. Nalder	230 & 460 tr. 500	Direct ..	2,350	1,728	300 kw.	£321,128*	58,989 (1,966 kw.)	87 arc ..		
87	COVENTRY	Coventry Corporation	1895	Jos. A. Jeckell	200	50~, 2-ph.	3,900	2,885	..	£218,908	45,545 (1,366 kw.)	117 arc, 117 cbn.		
88	CREWE	Crewe Corporation	1900	H. H. Denton	230 & 460	Direct ..	660	364	150 kw.	£52,434	22,572 (752 kw.)	29 arc, 740 cbn.		
89	CROMER	Cromer Electric Supply	1903	Edgar Hesketh	240 & 480	Direct ..	180	131	..	£31,280	10,864 (326 kw.)	10 arc, 20 inc.		
90	CROYDON	Croydon Corporation	1896	Alec. C. Cramb	230 A.C. & 230 D.C.	60~, 1-ph. & direct	5,750	3,255	..	£339,203	158,945 (5,298 kw.)	419 arc, 85 mtl., 57 N.		
91	DALKEITH	Electric Supply Corporation Ltd.	1904	K. A. Scott-Moncrieff*	235 & 450	Direct ..	..	48.3	58 kw.	£15,000	2,300 (76.7 kw.)	27 arc, 14 Nernst		
92	DARLINGTON	Darlington Corporation	1900	J. B. P. Lunn	230 & 460 tr. 500	Direct ..	1,470	937	368 kw.	£67,651	33,720 (1,124 kw.)	55 arc ..		
93	DARTFORD	Dartford Urban District Council	1901	J. D. Pember	230 & 460 tr. 500	Direct ..	700	525	50 kw. lg. 125 kw. tr	£40,970	11,700 (390 kw.)	6 arc, 43 cbn., 128 mtl., 134 N.		
94	DARTMOUTH	Urban Electric Supply Co., Ltd.	1902	G. E. Smith	240 & 480	Direct ..	330	207·4	168 kw.	£54,409	13,630 (554 kw.)	10 arc, 181 cbn., 10 mtl.		
95	DARWEN	Darwen Corporation	1899	Chas. Garnett	230 & 460 tr. 500	Direct ..	930	620	117 kw.	£57,846	18,948 (631.6 kw.)	19 arc, 1 cbn., 32 mtl., 111 N.		
96	DERBY	Derby Corporation	1893	T. P. Wilmshurst	230 & 460 D.C. 200 A.C. tr. 500	40~, 1-ph. & direct	5,000	2,100	375 A.	£270,000	130,525 (4,351 kw.)	186 arc, 518 cbn.		
97	DEVONPORT	Devonport Corporation	1901 tr. 1902 lg.	J. W. Spark	230, 460 & 500	Direct ..	1,800	998	270 A. lg., 1,000 A. tr.	£119,700	25,225 (831 kw.)	20 arc, 1 inc.		
98	DEWSBURY	Dewsbury Corporation	1894	R. H. Campion	220 & 440, tr. 500	Direct ..	1,000	356 lg., 300 tr.	90 A. for 4 hrs.	£54,605	21,940 (731 kw.)	31 arc, 32 cbn., 2 mtl.		
99	DISS	Suffolk Electricity Supply Co., Ltd.	1898	Napier Prentice	200	Direct ..	48	22	40 kw.		1,200 (40 kw.)	..		
100	DOLLAR	Electric Supply Corporation Ltd.	1904	K. A. Scott-Moncrieff*	225	Direct ..	40	17.7	15 kw.	£7,000	1,547 (51.5 kw.)	8 Nernst, 24 inc.		
101	DONCASTER	Doncaster Corporation	1900	E. S. Rayner	230 & 460	Direct ..	1,200	769	93 kw.	£78,000	..	3 arc ..		
102	DORKING	Dorking Electricity Supply	1904	Henry Joseph	240	Direct ..	180	139	49 kw.	£36,948	13,888 (4·3 kw.)	..		
103	DOVER	Dover Corporation	1895	L. W. Woodman	100 & 200 A.C. 500 D.C	100~, 1-ph. & direct	1,850	768	77 kw.	£184,806	47,200 (1,573 kw.	64 arc ; inc. & N. = 413 8-C.P.		
104	DUBLIN	Dublin Corporation	1892	Mark Ruddle	lg. 200, pr. 343	50~, 1-ph. & 3-ph.	6,000	3,250	..	£500,000	162,000 (4,800 kw.)	557 arc, 120 mtl.		
105	DUDLEY	Dudley Corporation	1899	Charles E. Savage	230 & 460, tr. 500	Direct ..	1,600	1,575	..	£83,000	29,543 (985 kw.)	53 arc, 222 cbn., 30 mtl.		
106	DULVERTON	Dulverton Electric Lighting Co., Ltd	1904	Edwards & Armstrong	230	Direct ..	50	21	10 kw.	£3,650	..	35 cbn. ..		
107	DUMBARTON	Electric Supply Corporation, Ltd.	1906	K. A. Scott.-Moncrieff*	240 & 480 tr. 500	Direct ..	420	89	50 kw.	£28,000	3,132 (104.5 kw)	..		
108	DUMFRIES	Dumfries Electricity Works	1906	Fourd Ely	230	Direct ..	200	22	125 kw.	..	1,020 (34 kw.)	..		
109	DUNDEE	Dundee Corporation	1898	H. Richardson	200 & 400 tr. 550	Direct ..	3,010	2,800	70 kw.	£179,135	107,380 (3,221 kw.)	83 arc ..		
110	EALING	Ealing Corporation	1894	J.Douglas Knight	102 & 204	40~, 1-ph.	1,770	1,207	94 kw.	£192,987	..	73 arc, 628 c.m., 420 mtl.		
	EASTBOURNE	Eastbourne Corporation	1882 & 1900*	J. K. Brydges	200	50~, 1-ph.	1,950	1,056	..	£183,226	90,401 (2,893 kw.)	96 arc, 12 mtl.		
		East Ham Corporation	1901	W. C. Ullmann	240 & 480	Direct ..	1,925	1,341	..	£122,511	45,709*	200 arc, 84		

		H.P.	Table	(ex. tr.)		to 0.7 ; tr. 1½ to 1	discount		ph., 25~ at 50.0 v. to substns.		
207 arc, 470 cbn.	491=3,035 H.P.	1,700 H.P. ..	6,986 KW.	10	Lg. 6 & 3, or 4 ; pb. lg. 1.7 ; pr. 1½ to 0.45 ; tr. 1.4	Max. dem., flat, sl. scale, 2-rate & t. sw.	4,142,011	Lighting and traction. Data to Mar. 25, 1908	33		
278 arc, 464 cbn., 232 N.	136=867½ H.P.	122=2,214 H.P.	*	*	Lg. 6 & 2, or 5 ; pb. lg. 3 & 2½ ; pr. 3 & 1 (htg. 1) ; tr. 2 to 1½	Max. dem.,flat rate and sliding scale	3,051,217	Lg. and tr. *Cannot be stated, owing to general adoption of mtl. fil. lamps. Data to Mar. 31, 1908	34		
..	834 H.P.	..	1,036.5 KW.	..	Lg. 4 ; pr. 2½ to 1½	Flat rate	207,933	.. ..	35		
..	330=7,691 H.P.	See other Table	11,336 KW.	16	Lg. 3½ & 1, or 3½ less 10% ; pr. 2 to 1, less 10 per cent. ; tr. 1.1	Max. demand & flat rate	10,791,105	*Also three-phase supply at 400 v., 50~. Data to March 31, 1908	36		
30 arc, 120 twin cbn., 23 N.	12=83 H.P.	..	412 KW. ..	..	Lg. 5 ; pb. lg. & pr. 2½	Flat rate and contract	..	Data to March, 1908	37		
174 arc, 150 cb., 508 mtl., 45 N.	1,379 H.P. (1906)	325 KW. ..	2,800 KW. (1905)	..	Lg. 6 & 1½, or 3½ ; pb. lg. 2 ; pr. 2 to 1 ; tr. 1½ to 1	Max. demand and flat rate	2,628,586	Lighting and traction	38		
132 arc ..	..	..	..	..	Pb. lg. 2	Flat rate	..	Public lighting & traction. Private supply by company	39		
8 mtl., 124 N.	135=316 H.P.	52=1,330 H.P.	6,993 KW.	29.7	Lg. 6 ; pr. 2 & 2½ ; tr. 1½ ..	Max. dem., flat, sl. sc., 2-rate & cont.	2,860,534	Lighting and traction. *Also 400 A.C., and traction 550 D.C. Data to December 31, 1907	40		
72 arc, 14 cbn.	1,445=6,818 H.P.	See other Table	12,333 KW. (ex. tr.)	5.4	Lg. 4 w. dis.† ; pb. lg. arc £12½ ; pr. 2 to 1½ ; htg. 2 ; tr. 1½	Flat rate and max. demand	15,115,000 (approx.)	Lg. & tr. Lamps free (one p. 30 n.). *50~3-ph. at 6,600 v. to substns. †Also 7d. & 1d. m. d. Data to 31/3/08	41		
32 arc, 200 cbn., 30 mtl.	..	..	395 KW. ..	3.95	Lg. & pr., 5 & 3½ ; pb. lg., arc £15, inc. £3 p.a.	Max. demand ..	164,608	Extension under consideration. Data to March 31, 1908	42		
251 cbn., 5 N.	21=136 H.P.	..	546 KW. ..	3	Lg. 6 & 4, or 5½ ; pb. lg. 2.9 ; pr. 4 & 1½, or 2½	Max. dem., flat rate, 2-r. & cont.	113,265	* F. Barritt Hills, Engineer & Manager	43		
15 arc, 368 inc.	8=30 H.P...	..	203 KW.	..	Lg. 4½ & 4 ; pb. lg. 2.8 ; pr. 1½ ; htg. 2½	Flat rate	96,680	* Energy purchased in bulk from S. Wales E. P. D. Co. at 1.375d. per unit	44		
15 arc, 184 inc.	10=21 H.P.	..	183 KW.	..	Lg. 7 & 2, or 4½ ; pr. 3 & 1, or 3	Max. demand & flat rate	41,000	.. ..	45		
39 arc, 117 cbn., 300 mtl., 21 N.	21=75 H.P.	..	600 KW.	38	Lg. 5 to 3½ ; pb. lg. arc £15, N. £5, inc. £5, £1 & £3 ; pr. 2 to 1½	Sliding scale ..	256,563	Data to Mar. 31, 1908	46		
..	16=40 H.P.	..	162 KW.	19	Lg. 5 ; pr. 4, 3 & 2	Flat rate	45,087	Gas power. Data to Mar. 31, 1908	47		
372 arc, 3,528 cbn.* 350 mtl.	364=1,425 H.P.	80=2,400 H.P.	10,320 KW.	5	Lg. 6 & 2, or 4, 3 ; pb. lg. 1½ ; pr. 1½ (t. sw. l.) ; tr. 1½	Max. dem., flat, sl. scale & t. switch	8,000,000	Lg. & tr. Old plant shut down ; new works supply H.T. 3 ph. 50~ to substs. Data to Mar. 31, '08. *Conv. to mtl. fil.	48		
693 arc, 9 inc.	5,805 H.P. ..	..	12,185 KW.	..	Lg. 4½ to 3 w. dis. ; pb. lg. arc £14½ & £21 ; pr. 1½ & ½ w. dis.	Lg. 2-rate meter, pr. m. d. & flat	6,202,571 (approx.)	*Also 50~, 3-phase, at 210 volts	49		
3 N.	45=112 H.P.	..	2,600 KW.	10	Lg. 7 & 4, or 6 ; pr. 4 & 1, or 2½	Max. demand, flat rate & 2-r. mtr.	792,938	Bulk supply to Chislehurst at 2,000 volts D.C. Data to Dec. 31, 1907	50		
12 arc, 36 cbn. 4 mtl.	15=54 H.P.	..	491 KW.	8.5	Lg. 6 ; pb. lg. 2½ ; pr. 4	Flat rate	122,715	Data to May 15, 1908	51		
70 cbn., 20 N.	2=1½ H.P. ..	..	67 KW. ..	..	Lg. 7 w. dis. ; pb. lg. contract ..	Flat rate	..	Part gas power	52		
4 arc, 30 cbn.	55 H.P. ..	..	..	..	Lg. 5 ; pb. lg. contract ; pr. 1½ ..	Flat rate with discount	..	.. ..	53		
5 arc, 19 inc., 4 Nernst	4=10 H.P. ..	..	97 KW.	..	Lg. 6 ; pr. 5	Flat rate	25,000	Suction gas power; overhead mains	54		
3 arc, 12 cbn.	163=527½ H.P.	46=3,460 H.P.	4,462.5 KW.	12.3	Lg. 3½ ; pb. lg. 1½ ; pr. 1½ & 1 ; tr. 1½	Flat rate & max. demand	3,434,979	Lighting and traction. Data to Mar. 31, 1908	55		
20 arc, 40 inc.	..	74=358 H.P.	..	..	Lg. 7 & 2, or 5 ; pb. lg. 3 ; pr. 2 to ½	Max. demand & flat, pr. sl. scale	332,881	Data to Dec. 31, 1907	56		
1 arc ..	112=787 H.P.	40=1,000 H.P.	1,671 KW.	19.0 (ex. tr.)	Lg. 5, or 6 & 3 ; pb. lg. 3 ; pr. 3 & 1, or 2 to 1½* ; tr. av. 1.37	Max. demand, flat rate, & sl. scale	1,338,014	Lighting and traction. * Pr. 65.5% of total on restricted-supply hour, 1d. to 3d. p. u. Data to Mar. 31, 1908	57		
36 arc, 18×2 inc.	209=1,530 H.P.	See other Table	2,522 KW.	21.6	Lg. 4, 3½, 3 ; pb. lg. arc £12, £14, inc. £1½ ; pr. 2, 1, 0.7 ; tr. 1.05	Flat rate & sliding scale	3,004,403	Lighting and traction. Data to Mar. 31, 1908	58		
14 arc, 381 cbn., 34 mtl., 21 N.	24=142 H.P.	..	478 KW.	9.5	Lg. 6 ; pb. lg. arc £14, inc. £2 ; pr. 3 to 2½	Flat rate with discount	317,171	*Corp. waterworks, 50 H.P., supplied at 1.3d. per unit ..	59		
30 arc ..	32=112 H.P.	..	898 KW. ..	..	Lg. 6, 4 & 3, or 7 & 3 ; pb. lg. arc £20 p.a. ; pr. 3 & 1½	Max. dem., flat & sl. scale with dis.	315,139	Max. load in September ; load through season heavier than in winter. Data to Mar. 31, 1908	60		
2 arc, 187 cbn.	93=956 H.P.	20=500 H.P.	1,776 KW.	36	Lg. 7 & 4, or 6 ; pr. 4 & 1, or ¾ ; tr. 1½	Max. demand, flat rate & contract	1,254,238	Lighting and traction. Data to Dec. 31, 1907	61		
1 arc ..	38=181 H.P.	..	1,855 KW.	5.5	Lg. 6 on 200 v., 7 on 100 v., with discounts ; pr. 3½ to 1½.	Flat rate with discounts, & contract	655,743	Data to Dec. 31, 1907	62		
20 arc, 510 mtl.	9=27 H.P. ..	..	183 KW.	32	Lg. 4 ; pb. lg. 2 ; pr. 2	Flat rate	76,798	*Electy. works £14,030; destructor £7,030. Energy obtained from refuse almost entirely. Data to May 15, 1908	63		
12 arc, 227 cbn., 355 mtl.	59=268 H.P.	..	980 KW.	0.2	Lg. 7 & 1½, or 4½ ; pb. lg. arc £25, inc. £3½ p.a.* ; pr. 1½	Max. demand and flat rate	651,076	*Two tant. 23 C.P. each, or two OSRAM 25 C.P., or one cbn., 25 C.P. Data to Mar. 31, 1908.	64		
612 arc, 112 cbn., 47 mtl.	326=2,118 H.P.	..	6,093 KW. ex. tr.	3	Lg. 7 & 2, or 3½ ; pb. lg. arc £14, inc. £2 14s. p.a. ; pr. 4 & 1, or 1½	M. dem., flat, 2-rate, prept. & contract	3,890,182	*Also 400 v. A.C. †Also 50~, 3-ph. Tr. dept. supplies lg. dept. with D.C. & 3-ph. Data to Mar. 1908	65		
52 arc, 20 mtl.	62 consumers, 260 HP.	30=450 H.P.	1,320 KW.	8.8	Lg. 5 to 4* ; pb. lg. arc £21 13s 4d & £15 ; pr. 2(restd. hrs. 1) ; tr. 2 to 1½	Max. demand, flat, sl. sc., 2 rate& spl.	1,014,904	Lighting and Traction. *Also £7 per KW. & 2d. per unit. Data to Mar. 31, 1908	66		
13 arc, 84 inc.	1=67 H.P. ..	..	117 KW...	..	Lg. 7½ w. dis. (=6 to 3½) ; pb. lg. contract	Flat rate with discounts	68,479	5 miles overhead mains to Carlow. Water power; steam plant at C. as stand-by	67		
..	20=99 H.P.	..	286 KW. ..	35	Lg. 5 ; pr. 2½, w. discounts ..	Flat rate	..	*Leased from the Corporation	68		
..	10=55 H.P..	..	361 KW. ..	7.75	Lg. 7 & 4, or 6 ; pr. 4 & 1½, or 2½	Max. demand & flat rate	83,704	Data to Dec. 31, 1907	69		
..	..	..	..	..	Lg. 6 ; pb. lg. inc. £3 p.a. ..	Flat rate	..	Water power	70		
21 arc, 288 Nernst	40=152 H.P.	..	750 KW.	5	Lg. 5½ to 4½ ; pb. lg. arc £25½, N. £3 3s. p.a. ; pr. 3	Sliding scale ..	519,871	Data for 1905-7	71		
388 arc, 19 inc.	23=71½ H.P.	40=1,240 H.P.	2,276 KW. (ex. tr.)	..	Lg. 5½, 4 & 2 ; pb. lg. 3 ; pr. 2 ; tr. 1.6	Max. demand & flat rate	..	Lighting A.C. Tramway Co. supplied with D.C. ..	72		
..	..	..	..	..	Lg. 7 ; pr. 3	Flat rate	..	.. ..	73		
9 arc, 103 cbn., 20 mtl., 62 N.	40=200 H.P.	..	347 KW. ..	..	Lg. 5 ; pb. lg. contract ; pr. 4 & 1½, or 2	Flat rate, contract & max. demand	176,000	Data to Dec. 31, 1907	74		
196 arc, 538 inc. 179 N., 11 mtl.	134=427 H.P.	27=664 H.P.	2776.5 KW.	..	Lg. 3½ ; pr. 1½ & 1 ; tr. 1½	Flat rate	1,543,676	Lighting and traction	75		
24 fl. arc, 36 cbn., 12 mtl.	137=329 H.P.	28=700 H.P.	1,600 KW.	5.9	Lg. 6 & 3, or 4, less 10% ; pb. lg. arc £12½ ; pr. 1½, 1½ & 1 ; tr. 1½	Max. demand & flat rate with dis.	1,061,892	Lighting and traction. Data to Mar. 31, 1908	76		
..	..	..	437 KW...	5	Lg. 8 & 4, or 7 ; pr. 4	Max. demand and flat rate	105,977	*Bulk supply from Bromley at 2,000 v. †Includes heating. Data to Dec. 31, 1907	77		
..	95=603 H.P.	..	1,727 KW.	..	Lg. 5 (shops 4) ; pr. 2 to 1½ ..	Flat rate with discounts	893,144	Data to Dec. 31, 1907	78		
..	1=2 H.P. ..	..	64 KW. ..	..	Lg. 6 ; pr. 5 & 1½	Flat rate	19,278	Suction gas plant	79		
..	..	..	..	..	Lg. 5 ; pr. 3	Flat rate	..	.. ..	80		
3 arc, 6 mtl.	41=217 H.P.	600 H.P. ..	768 KW. ..	12.3	Lg. 4 ; pb. lg. 2 ; pr. 2 & 1 ; tr. 1.5 to 1.3	Flat rate & sliding scale	575,420	Lighting and traction. Data to Mar. 31, 1908	81		
22 arc, 214 inc.	137½ H.P. ..	..	1,233 KW.	..	Lg.5 ; pr. 2½ (large works 1½ & 1)	Flat rate	..	.. ..	82		
30 cbn., 8 mtl., 294 Nernst	33=113½ H.P.	36=816 H.P.	1,803 KW.	4.5	Lg. 4 to 3½ ; pb. lg. 2½ & 1½ ; pr. 4 to 2 ; bulk, 1½ to 1 ; tr. 1½	Flat rate with discounts	1,381,842	Lighting and traction. Data to Mar. 31, 1908	83		
..	126=328½ H.P.	24=672 H.P.	1,218.5 KW.	11	Lg. 6 & 2½, or 4½ ; pr. 3 & 1, or 2½ ; tr. 2 to 1½	Max. demand and flat rate	688,323	Lighting and traction. Data to Mar. 31, 1908	84		
75 arc, 1 Nernst	6=30 H.P. ..	..	667 KW...	9	Lg. 5 ; pb. lg. 2 ; pr. 3	Flat rate	207,943	Data to Mar. 31, 1908	85		
87 arc ..	265=1,848 H.P.	70=1,330 H.P.	4,639 KW.	10	Lg. 5, 4 & 3 ; pb. lg. arc £15 p.a. ; pr. 2 & 1½	Flat rate det. by max. demand	3,963,732	Lighting and traction. * £148,105 lg. ; £173,022 tr. Data to Dec. 31, 1907	86		
117 arc, 117 cbn.	4,111 H.P. ..	..	5,134 KW.	22	Lg. 6, 3 & 1, or 4½ ; pb. lg. £800 p.a. ; pr. 1½ & 1	Max. demand and flat rate	4,822,114	Data to Mar. 31, 1908	87		
29 arc, 740 cbn.	45=160 H.P.	..	936 KW. ..	17	Lg. 6 & 3, or 4 ; pb. lg. 2½ ; pr. 3 to 1½	Max. demand and flat rate with dis.	537,435	Data to Mar. 31, 1908	88		
10 arc, 20 inc.	20=31 H.P.	..	356 KW. ..	15.5	Lg. 7 & 4, or 6* ; pb. lg. arc £17 p.a. ; pr. 4 & 1½, or 2½	Max. demand and flat rate with dis.	91,269	*Slot meter 7d. per unit, inc. meter rent	89		
419 arc, 85 mtl., 57 N.	140=714 H.P.	200=7,000 H.P.	11,011 KW.	29.6	Lg. 7 & 1½, or 5 (basements 2½) ; pr. (t. sw.) 3 & 1½, or 2½ ; tr. 2*	Max. dem., flat, 2 rate, con. with dis., t.sw.	5,875,003	Lighting and traction. *Pb. lg. arc £17, £14 ; inc. £3 8s. 6d., £2 18s. 4d. p.a. Data to Mar. 31, 1908	90		
27 arc, 14 Nernst	17=37½ H.P.	..	130.5 KW.	16.3	Lg. 4½ less 10 % ; pb. lg. 3 ; pr. 3	Flat rate	66,180	*Resident Engineer, H. A. Tulloch. Data for 1903-7 ..	91		
55 arc ..	136=1,019 H.P.	32=800 H.P.	93 KW.	17	Lg. 4½ & 1, or 4 ; pb. lg. arc £15 p.a. ; pr. 1½ to ¾* ; tr. 1½	Flat rate, max. demand & sl. scale	1,434,563	Lighting and traction. Also £4 per KW. p.a., and ½ per unit. Data to Mar. 31, 1908	92		
6 arc, 43 cbn., 128 mtl., 134 N.	43=356½ H.P.	12=600 H.P.	1074.5 KW.	3	Lg. 7 & 2, or 4* ; pb. lg. arc £21, £10† ; pr. 2½ to 1½ ; tr. 2 to 1½	Max. demand and flat rate w. dis.	836,202	Lg. & tr. *Prept. meters, 6d. †N. (½.) or 2 mtl., £5 ; N. (½.) or cbn. £3 3s. Data to Mar. 31, 1908	93		
10 arc, 181 cbn., 10 mtl.	26=105 H.P.	..	704 KW.	7.2	Lg. 7 & 3, or 6 ; pb. lg. £559 p.a. ; pr. 4 & 1½, or 2½	Max. demand and flat rate	285,511	Data to Dec. 31, 1907	94		
19 arc, 1 cbn., 32 mtl., 111 N.	113=413 H.P.	32=1,120 H.P.	1,074 KW.	9.4	Lg. 4½ ; pb. lg. 3 ; pr. 2 ; tr. 1½	Flat rate and contract	660,812	Lighting and traction, with destructor. Data to Mar. 31, 1908	95		
186 arc, 518 cbn.	155=2,092 H.P.	98=2,000 H.P.	7,753 KW.	5	Lg. 6 to 2½ ; pb. lg. inc. 2 ; pr. 3 to 1 ; tr. 1½*	Max. demand and sliding scale*	3,018,664	Lg. & tr. *Special max. demand rates for lg. and pr. ; pb. lg., arc £23 (⅛nt. £10). Data for 1907-8	96		
20 arc, 1 inc.	39=108½ H.P.	76=1,900 H.P.	2,544 KW.	..	Lg. 4* ; pb. lg. arc £22½, inc. £3½ ; pr. 1½ ; tr. 3 to 1.4	Flat, sl. sc., 2-rate, cont., t. sw., spl.	1,695,289	Lighting and traction. *By 2-rate mtr., 4 & 1½d. Data to Mar. 31, 1908	97		
31 arc, 32 cbn., 2 mtl.	94=403 H.P.	20=500 H.P.	1,495 KW.	5.6	Lg. 5½ & 3, or 4 ; pr. 2½ & 1 (resid. hrs. 1) ; tr. 1.5 & 1.4	Max. demand and flat rate	1,007,012	Traction supply to Yorks. (W.D.) Electric Tramways. Data to Mar. 31, 1908	98		
..	5=8 H.P. ..	See other Table	45 KW. ..	..	Lg. 8 & 6 ; pr. 6 to 3 ; tr. 1½ ..	Max. demand and flat rate	..	Lighting and traction. Gas power..	99		
8 Nernst, 24 inc.	2=1 H.P. ..	..	56 KW. ..	12.5	Lg. 6 ; pb. lg. 3 ; pr. 3	Sliding scale ..	15,968	Overhead mains, bare copper. *Resident Engineer, J. B. Mitchell. Data for 1906-7	100		
3 arc ..	41=219 H.P.	50=1,250 H.P.	2,334 KW.	..	Lg. 5, 4½ & 3 ; pb. lg. 3 ; pr. 2 to 1½ ; tr. 1½	Max. demand and flat rate	930,531	Lighting and traction. Data to June 1, 1908	101		
..	14=18 H.P.	..	492 KW.	10.7	Lg. 7 & 4, or 6 ; pr. 2½	Max. demand & flat rate	121,028	Data to Dec. 31, 1907	102		
64 arc ; inc. & N. = 413 8-C.P.	44=303 H.P.	21=1,050 H.P.	..	18.1	Lg. 7 & 3, or 6 w. dis.* ; pr. 2½ ; tr. 2½	Max. demand & flat rate w. discount	1,175,162	Lighting and traction. *Pb. lg. arc £30 p.a., or 2½d. p.u., inc. (12 C.P.) £1 12s. p.a. Data to Mar. 31, 1908	103		
557 arc, 120 mtl.	180=842 H.P.	..	5,368 KW.	21	Lg. 6 & 2½ ; pb. lg. arc £22 p.a. ; pr. 1½ & 1	Max. demand & flat rate	3,880,000 (estimated)	Data to Mar. 31, 1908	104		
33 arc, 222 cbn., 30 mtl.	110=758 H.P.	See other Table	1,687 KW. (ex. tr.)	11	Lg. 6 & 1½, or 4 ; pb. lg. 2 (arc £20 p.a.) ; pr. 6 & 1 ; tr. 2 to 1, av. 1.3	2-rate meter, flat rate, & prept.	2,022,207	Lighting and traction. Data to Mar. 31, 1908	105		
35 cbn. ..	..	..	34 KW. ..	45	Lg. 6 ; pb. lg. £35 ; pr. 4 to 1 ..	Flat rate & sliding scale	17,300	.. ..	106		
..	9=12 H.P...	12	117 KW. (ex. tr.)	..	Lg. 4½ ; pr. 2½ ; tr. 1½	Flat rate	50,000	*Resident Engineer, W. A. Ritchie. Data for 1903-7 ..	107		
..	14=36.5 H.P.	..	59 KW.	10	Lg. 7 ; pr. 3	Flat rate, with discounts	18,037	Small rate of increase due to mtl. filament lamps. Data to Dec. 31, 1907	108		
83 arc ..	404=1,708 KW.	144=3,580 H.P.	8,549 KW.	24	Lg. 3½ to 2 ; pb. lg. arc £15, £12, £8 o.a. ; pr. 2½ max. ; tr. 1½	Flat rate with dis. ; spl. m.d. for pr.	4,719,085	Lighting and traction. Data to April 30, 1908	109		
73 arc, 628 c.m., 420 mtl.	47=182 H.P.	..	4,031 KW.	9	Lg. 4½, or 7 & 2 ; pb. lg. arc £21½, inc. £2.0.8* ; pr. 2 & 1½	Flat rate & max. demand	1,527,893	*OSRAM lamps supplied free for street lighting. Data to Mar. 31, 1908	110		
96 arc, 12 mtl.	99=279½ H.P.	..	2,976 KW.	9.9	Lg. 5½ or 7 & 3½ (arc 4½) ; pb. lg. arc £22 p.a. ; pr. 2½ to 1	Flat rate, max. demand, & 2-rate mtr.	1,253,338	*Purchased from Company in 1[illegible]	[illegible]		
200 arc, 84	76=234½ H.P.	80=2,000 H.P.	3,519 KW.	5.2	Lg. 5 & 3, or 3½ ; pb. lg. arc £18 ;	Max. dem., flat, sl.	2,116,000	Lighting and traction. *Loca[illegible]	[illegible]		

			1903 lg.		500				1,000 A. tr.		(831 KW.)		
98	DEWSBURY	Dewsbury Corporation	1894	R. H. Campion	220 & 440, tr. 500	Direct	1,000	356 lg., 300 tr.	90 A. for 4 hrs.	£54,605	21,940 (731 KW.)	31 arc, 32 cbn., 2 mtl.	
99	DISS	Suffolk Electricity Supply Co., Ltd.	1898	Napier Prentice	200	Direct	48	22	40 KW.		1,200 (40 KW.)		
100	DOLLAR	Electric Supply Corporation Ltd.	1904	K. A. Scott-Moncrieff*	225	Direct	40	17.7	15 KW.	£7,000	1,547 (51.5 KW.)	8 Nernst, 24 inc.	
101	DONCASTER	Doncaster Corporation	1900	E. S. Rayner	230 & 460	Direct	1,200	769	23 KW.	£78,000		3 arc	
102	DORKING	Dorking Electricity Supply	1904	Henry Joseph	240	Direct	160	139	49 KW.	£36,948	13,388 (4·3 KW.)		
103	DOVER	Dover Corporation	1895	L. W. Woodman	100 & 200 A.C. 500 D.C.	100~, 1-ph. & direct	1,850	768	77 KW.	£184,806	47,200 (1,573 KW.	64 arc; inc. & N. = 113 8-C.P.	
104	DUBLIN	Dublin Corporation	1892	Mark Ruddle	lg. 200, pr. 343	50~, 1-ph. & 3-ph.	6,000	3,250		£500,000	182,000 (4,880 KW.)	557 arc, 120 mtl.	
105	DUDLEY	Dudley Corporation	1899	Charles E. Savage	230 & 460, tr. 500	Direct	1,600	1,575		£83,000	29,543 (985 KW.)	53 arc, 222 cbn., 30 mtl.	
106	DULVERTON	Dulverton Electric Lighting Co., Ltd	1904	Edwards & Armstrong	230	Direct	50	21	10 KW.	£3,650		35 cbn.	
107	DUMBARTON	Electric Supply Corporation, Ltd.	1906	K. A. Scott-Moncrieff*	240 & 480 tr. 500	Direct	430	89	50 KW.	£23,000	3,132 (104.5 KW.)		
108	DUMFRIES	Dumfries Electricity Works	1906	Foured Ely	230	Direct	200	22	125 KW.		1,020 (34 KW.)		
109	DUNDEE	Dundee Corporation	1898	H. Richardson	200 & 400 tr. 550	Direct	3,010	2,800	70 KW.	£179,135	107,380 (3,221 KW.)	83 arc	
110	EALING	Ealing Corporation	1894	J. Douglas Knight	102 & 204	40~, 1-ph.	1,770	1,207	94 KW.	£192,987		79 arc, 628 cbn., 420 mtl.	
111	EASTBOURNE	Eastbourne Corporation	1882 & 1900*	J. K. Brydges	200	50~, 1-ph.	1,950	1,056		£183,226	90,400 (2,893 KW.)	96 arc, 12 mtl.	
112	EAST HAM	East Ham Corporation	1901	W. C. Ullmann	240 & 480 tr. 500	Direct	1,925	1,341		£122,511 (Mar., 1907)	45,709* (1,524 KW.)	200 arc, 84 cbn., 25 mtl.	
113	EBBW VALE	Ebbw Vale Urban District Council	1906	R. P. Wilson (Cons.) Wm. Horsfall (Res.)	240 & 480	Direct	Bulk supply*	105		£15,000 approx.	3,483 (116 KW.)	24 arc, 408 × 2 mtl.	
114	ECCLES	Eccles Corporation	1898	H. W. Angus	200	50~, 1-ph.	280	135	16 KW.	£19,302	10,374 (346 KW.)	2 arc, 426 inc.	
115	EDINBURCH	Edinburgh Corporation	1895	F. A. Newington	230 A.C., 230 & 460 D.C.	50~, 1-ph. & direct	12,817	10,657	for 9 hrs. 3,600 A H.	£978,000 estimated	684,547 (22,818 KW	1,194 arc, 187 cbn.	
116	ELLAND	Elland Urban District Council	1903	A. V. Wardrop	240 & 480	Direct	280	182	100 A. for 7 hrs.	£14,935	9,291 (310 KW.)	24 arc, 22 cbn., 46 mtl.	
117	ENFIELD	North Metropolitan Electrical Power Distribution Co., Ltd.	1906	A. H. Bennett*	240 & 480	Direct	300	30	110 KW.	£24,261	2,168 (72 KW.)		
118	EPSOM	Epsom Urban District Council	1902	H. F. Foster	230 & 460	Direct	230	171	37 KW.	£34,000 estimated	11,825 (394 KW.)	12 arc, 144 inc.,	
119	ERITH	Erith Urban District Council	1903	Geo. E. Heath	950, 400 & 200 tr. 500	50~3, &1-ph.	1,350	705		£67,885*	22,486 (749 KW.)	238 mtl. 20 arc, 512 cbn., 80 N. 7 × 2 mdn.	
120	EXETER & HEAVITREE	Exeter Corporation	1889*	H. D. Munro	100 A.C., tr. 500 D.C.	60~, 1 & 2 ph., & D.C.	1,500	940		£107,500	48,363 (1,612 KW.)	37 arc, 476 mtl.	
121	EXMOUTH	Electric Supply Corporation, Ltd.	1904	K. A. Scott-Moncrieff*	225 & 450	Direct	300	40	80 KW.	£27,000	440 0		
122	FALKIRK	Falkirk Corporation	1903	J. McMillan	230	Direct	500	262	150 KW.	£31,000	17,325 (577 KW.)	45 arc, 86 cbn., 7 Nernst	
123	FALMOUTH	Electric Supply Corporation, Ltd.	1906	K. A. Scott-Moncrieff*	240 & 480	Direct	300	22.7	86 KW.	£26,000	(146.7 KW.)		
124	FAREHAM	Fareham Urban District Council	1890	A. Blake	100	125~, 1-ph.	140	63		£11,490		27 arc, 109 inc.	
125	FARNWORTH	Farnworth Urban District Council	1901	R. B Leach	230 & 440 tr. 500	Direct	610	550	160 A.	£40,186		133 arc, 136 inc.	
126	FAVERSHAM	Faversham Corporation	1904	G. Sommerville	230 & 460	Direct	270	90	46 KW.	£22,171	11,318 (377 KW.)	10 arc, 20 cbn.,	
127	FELIXSTOWE & WALTON	Suffolk Electricity Supply Co., Ltd.*	1899	Napier Prentice	200	Direct	200	133	20 KW.		5,200 (173 KW.)	23 mtd., 90 N. 40 arc, 10 mtl.	
128	FELLING	North rn Counties Electricity Supply Co., Ltd.	1904		230 & 460	Direct	75*		400 A.H.	£15,510	8,000 (267 KW.)		
129	FESTINIOG	Yale Electric Power Co.	1900	T. P. O. Yale	220, 230 & 500	Direct	720		210 A.H.	£20,000	7,000 (233 KW.)	170 arc & inc.	
130	FINCHLEY	Finchley Urban District Council	1903	Edward Calvert	250 & 500	Direct	1,000	539	200 KW.	£76,000	37,933 (1,264.5 KW.	2,644 inc.	
131	FLADBURY	Fladbury Electric Light and Power Co., Ltd.	1900	J. Wm. Wagstaff	220	Direct	40					6 inc. (equiv. 8-C.P.)	
132	FLEETWOOD	Fleetwood & District Electric Light & Power Syndicate	1900	Owen Hansom	200 & 400	Direct	350	160	88 KW.		18,000 (600 KW.)	21 arc, 600 inc.	
133	FOLKESTONE	Folkesto e Electricity Supply Co., Ltd.	1898	T. Hesketh	210	Direct	1,750	1,080		£193,591	94,400 (3,147 KW.)	88 arc, 433 N. and inc.	
134	FOLKESTONE AND DISTRICT	Folkestone District Electric Light & Power Co., Ltd.	1899	W. G. F. Webster	110	Direct	100	50	10 KW.	£6,000	1,500 (50 KW.)		
135	FOOTS CRAY	Foots Cray Electricity Supply Co., Ltd.	1907	A. Wright (Manager)	100	50~, 1-ph.				£10,000			
136	FORT WILLIAM	Fort William Electric Lighting Co., Ltd.	1898	I. Reid	150 & 300	Direct	120	100	30 KW.	£11,091	6,000 (200 KW.)	6 arc, 60 inc.	
137	FRINTON-ON-SEA	Frinton-on-Sea & District Electric Light & Power Co., Ltd.	1903	W. Hockley	230 & 460	Direct	60	40	45 KW.	£7,500	2,500 (83 KW.)		
138	FROME	Frome Electricity Supply	1901	F. H. Merritt	240 & 480	Direct	525	251	57 KW.	£35,000 (sanctioned)	7,631 (254 KW.)	10 arc, 258 N.	
139	GALWAY	Galway Electric Co., Ltd.	1889	Percy A. Spalding (Eng. & Man.)	110	Direct	145	123	70 KW.	£14,000	4,460 (149 KW.)	19 arc, 140 inc.	
140	GILLINGHAM	Gillingham Corporation	1897	A. D. Chalmers	220 D.C., 230 & 100 A.C.*	Direct & 50~, 3-ph.	950	390		£72,000	19,500 (585 KW.)	2 arc, 142 cbn., 364 mtl.	
141	GLASCOW	Glasgow Corporation	1892	W. W. Lackie	250 & 500	Direct	27,145	19,646		£1,587,486	883,101 (23,437 KW.)	887 arc	
142	GLOSSOP	Urban Electric Supply Co., Ltd.	1903	C. E. Knowles	240 & 480	Direct	425	395	60 KW.	£52,143	8,360 (278 KW.)	45 Nernst	
143	GLOUCESTER	Gloucester Corporation	1900	G. R. White	220 & 440, tr. 500	Direct	1,750	998	235 KW.	£87,176	41,760 (1,392 KW.)	175 arc, 12 mtl., 3 Nernst	
144	GODALMING	Urban Electric Supply Co., Ltd.	1902	R. S. Robertson	240 & 480	Direct	380	251	45 KW.	£55,580	22,207 (740 KW.)	10 arc, 240 inc., 1 N.	
145	GORSEINON	Gorseinon Electric Light Co. Ltd.	1894	D. Powell	200	Direct	60	50		£2,800	1,646 (55 KW.)	56 inc.	
146	GOSPORT & ALVERSTOKE	Gosport & Alverstoke Electric Lighting Co., Ltd.	1907	J. Fereday Glenn	240 & 480	Direct	400						
147	GOVAN	Govan Corporation	1900	T. C. Parsons	250 & 500	Direct	1,950	1,443	225 KW.	£123,415	39,680 (1,321 KW.)	215 arc	
148	GRANTHAM	Urban Electric Supply Co., Ltd.	1903	J. E. Edmundson	240 & 480	Direct	380	237	650 A.H.	£65,903	23,654 (788 KW.)		
149	GRAVESEND	Gravesend Corporation	1902	C. F. McInnes	230	Direct	700	453	630 A.H.	£49,603		27 arc	
150	GRAYS THURROCK	Grays Thurrock Urban District Council	1901	E. D. Long	230 & 460	Direct	380	160	97 KW.	£23,680	10,173 (339 KW.)	201 inc., 45 N., 19 mtl.	
151	GREAT CROSBY AND WATERLOO	Liverpool District Lighting Co., Ltd.	1897	W. M. Horsfall	220	Direct	435	317	160 A.	£57,224	46,988 (1,565 KW.)	24 mtl. 78 N.	
152	GREENOCK	Greenock Corporation	1899	J. A. Robertson	250 & 500 D.C. 110 A.C.; tr 500	Direct and 50~, 3-ph.	3,500	2,020	275 KW. lg. 370 KW. tr.	£150,000	55,800 (1,860 KW.)*	50 arc, 2 N., 4 mtl.	
153	GRIMSBY	Grimsby Corporation	1901	W. A. Vignoles	230 & 460	Direct	1,400	1,225		£93,026	44,690 (1,489 KW.)*	80 arc, 58 cbn., 22 mtl., 1 N.	
154	GUERNSEY	Guernsey Electric Light and Power Co., Ltd.	1900	C. Lakin-Smith	210 & 420	Direct	1,070	861	600 KW.	£127,836	25,141 (838 KW.)	16 mtl.	
155	GUILDFORD	Guildford Electric Supply Co., Ltd.	1896	H. L. Alderton	215 & 480	Direct	550	310	27 KW.	£58,271	30,060 (1,000 KW.	1 arc, 6 mtl.	
156	HALIFAX	Halifax Corporation	1894	W. M. Rogerson	230 & 460, tr. 550	Direct	4,750	2,800	670 KW.	£251,714	106,235 (3,541 KW.	31 arc, 78 cbn., 4 mtl., 2 N.	
157	HAMILTON	Edmundson's Electricity Corporation (Lessees)	1903	T. M. Colson	240 & 480	Direct	380	339	150 KW.	£61,571	14,401 (480 KW.)	66 arc, 8 N.	
158	HANDSWORTH	Handsworth Urban District Council	1905	F. A. Nixon	240, tr. 500	Direct	735	260	143 KW.	£65,655	13,980 (419 KW.)	124 arc, 246 cbn., 1 Nernst	
159	HANLEY (STAFFS.)	Hanley Corporation	1894	C. H. Yeaman	100 & 200 (pr. 200 & 400)	100~, 1-ph.	1,662	1,024		£102,000	62,882 (2,012 KW.)	71 arc, 412 cbn. (posts), 1 N.	
160	HARROCATE	Harrogate Corporation	1897	G. Wilkinson	100 & 200	50~, 1-ph.	2,150	1,003		£121,282	76,132 (2,537 KW.)	58 arc, 222 cbn., 124 mtl., 27 N.	
161	HARROW	Harrow Electric Light and Power Co., Ltd.	1896	J. A. Horsley	220 & 440	Direct	554	322	66 KW.	£69,813	33,042 (1,101 KW.		
162	HARTLEPOOL	Northern Counties Electricity Supply Co., Ltd.	1904	C. W. Fairweather (Gen. Man.)	230 & 460	Direct	200	80	100 KW.		2,000 (67 KW.)	52 arc, 104 inc.	
163	HASTINGS	Hastings Corporation	1892	R. F. Ferguson	200 & 400	100~, 1-ph.	1,850	700 5	30 KW.	£160,428	41,515 (1,384 KW.)	105 arc, 10 inc.	
164	HAWICK	Urban Electric Supply Co., Ltd.	1901	A. N. Rye	240 & 480	Direct	600	445	50 KW.	£64,918	14,916 (497 KW.)	12 arc, 3 cbn., 433 × 2 mtl.	
165	HEBBURN	Northern Counties Electricity Supply Co., Ltd.	1903	C. W. Fairweather	230 & 460*	Direct & 40~, 3-ph.	1,900	935	500 A.H.	£70,709	8,230 (274 KW.)	10 arc, 435 inc., 21 Nernst	
166	HEBDEN BRIDGE	Hebden Bridge Urban District Council	1904	J. W. Garside	240 & 480	Direct	215	120	500 A.H.	£11,500	4,500 (150 KW.)	86 mtl.	
167	HECKMONDWIKE	Heckmondwike Urban District Council	1901	G. H. Carter	230 & 470 tr. 550	Direct	975	674	300 KW.	£40,000	10,932 (334 KW.)	10 arc, 180 cbn. 10 mtl., 20 N.	
168	HEREFORD	Hereford Corporation	1899	W. T. Kerr	220 & 440	Direct	810	310	50 KW.	£39,350	21,100 (638 KW.)	4 arc	
169	HERTFORD	North Metropolitan Elec. Pr. Distribution Co., Ltd.	1901	J. M. Bowman*	230 & 460	Direct	300†	145	40 KW.	£9,520 dist.)	8,678 (289 KW.)	10 arc, with 30 inc.	
170	HESTON AND ISLEWORTH	Heston and Isleworth Urban District Council	1904	Percy E. Rycroft	240 & 480	Direct	500	334	200 KW.	£56,338	20,878 (696 KW.)	51 arc, 73 cbn. 193 mtl.	
171	HEXHAM	Hexham and District Electric Supply Co., Ltd.	1906	Wilfred Hall (Cons. Eng.)	120 lg., 220 & 440 pr.	40~, 3-ph.	100	86		£8,484	1,560 (52 KW.)		
172	HEYWOOD	Heywood Corporation	1900	Jas. Scott	200 & 400 tr 500	Direc	520	92	100 KW.	£17,631	6,615 (220·5 KW.)	4 arc	
173	HICH BARNET	North Metropolitan Elec. Pr. Distribution Co., Ltd.	1900	H. Bernard Sale*	230 & 460	Direct	500	300		£27,617	11,225 (374 KW.)	18 flame arc, 163 inc.	
174	HICH WYCOMBE	Wycombe (Borough) Electric Light & Power Co., Ltd.	1898	W. E. Brandreth	210 & 420	Direct	830	523	110 KW.	£99,661	28,897 (963 KW.)	12 arc, 14 × 2 mtl., 352 N.	
175	HINDHEAD AND DIST.	Hindhead & District Electric Light Co., Ltd.	1900	T. B. Reader	220 & 440	Direct	100	54	27 KW.	£15,000	4,500 (150 KW.)		
176	HITCHIN	Electric Supply Corporation, Ltd.	1903	K. A. Scott-Moncrieff*	240 & 480	Direct	300	47	77 KW.	£17,000	2,827 (94 KW.)		
		Holyhead Urban District Council	1904	P. Williams	200 & 400	Direct	220	149	240 KW.	£21,405	6,346 (212 KW.)	9 arc, 452 cbn.	

31 KW.)							£3½; pr. 1½; tr. 3 to 1.4	cont., t. sw., spl.		Data to Mar. 31, 1905	
21,940	31 arc, 32 cbn.,	94=403 H.P.	20=500 H.P.	1,495 KW.	5.6	Lg. 5½ & 3, or 4; pr. 2½ & 1	Max. demand and	1,007,012	Traction supply to Yorks. (W.D.) Electric Tramways.		98
731 KW.)	2 mtl.					(restd. hrs. 1); tr. 1.5 & 1.4	flat rate		Data to Mar. 31, 1908		
1,200	..	5=8 H.P. ..	See other Table	45 KW. ..	..	Lg. 8 & 6; pr. 6 to 3; tr. 1½ ..	Max. demand and flat rate	..	Lighting and traction. Gas power..		99
0 KW.)											
1,547	8 Nernst, 24	2=1 H.P. ..	..	56 KW. ..	12.5	Lg. 6; pb. lg. 3; pr. 3	Sliding scale ..	15,968	Overhead mains, bare copper. *Resident Engineer,		100
1.5 KW.)	inc.								J. B. Mitchell. Data for 1906-7		
..	3 arc ..	41=219 H.P.	50=1,250 H.P.	2,334 KW.	..	Lg. 5, 4½ & 3; pb. lg. 3; pr. 2	Max. demand and	930,531	Lighting and traction. Data to June 1, 1908		101
						to 1½; tr. 1½	flat rate				
13,888	..	14=18 H.P.	..	492 KW.	10.7	Lg. 7 & 4, or 6; pr. 2½	Max. demand & flat rate	121,038	Data to Dec. 31, 1907		102
17,200	64 arc; inc. &	44=303 H.P.	21=1,050 H.P.	..	18.1	Lg. 7 & 3, or 6 w. dis.*; pr. 2½;	Max. demand & flat	1,175,162	Lighting and traction. *Pb. lg. arc £30 p.a., or 2½d. p.u.,		103
573 KW.	N.=413 8-C.P.					tr. 2½	rate w. discount		inc. (12 C.P.) £1 12s. p.a. Data to Mar. 31, 1908		
162,000	557 arc, 120	180=842 H.P.	..	5,388 KW.	21	Lg. 6 & 2½; pb. lg. arc £22	Max. demand &	3,880,000	Data to Mar. 31, 1908		104
60 KW.)	mtl.					p.a.; pr. 1½ & 1	flat rate	(estima ed)			
29,543	55 arc, 222 cbn.,	110=753 H.P.	See other Table	1,687 KW. (ex. tr.)	11	Lg. 6 & 1½, or 4; pb.lg. 2 (arc £20	2-rate meter, flat	2,022,207	Lighting and traction. Data to Mar. 31, 1908		105
85 KW.)	30 mtl.					p.a.); pr. 6 & 1; tr. 2 to 1, av.1.3	rate, & prept.				
..	35 cbn. ..	..	..	34 KW. ..	45	Lg. 6; pb. lg. £35; pr. 4 to 1..	Flat rate & sliding sc le	17,300	.. ..		106
3,132	..	9=12 H.P...	12	117 KW. (ex. tr.)	..	Lg. 4½; pr. 2½; tr. 1½	Flat rate	50,000	*Resident Engineer, W. A. Ritchie. Data for 1903-7 ..		107
4.5 KW.)											
1,020	..	14=26.5 H.P.	..	59 KW.	10	Lg. 7; pr. 3	Flat rate, with dis-	18,037	Small rate of increase due to mtl. filament lamps.		108
34 KW.)							co nts		Data to Dec. 31, 1907		
07,380	83 arc ..	404=1,708 KW.	144=3,580 H.P.	8,549 KW.	24	Lg. 3½ to 2; pb. lg. ar s £15, £12,	Flat rate with dis.;	4,719,085	Lighting and traction. Data to April 30, 1908		109
21 KW.)						£8 o.a.; pr. 2½ max.; tr. 1½	spl. m.d. for pr.				
..	73 arc, 628 c m.,	47=182 H.P.	..	4,031 KW.	9	Lg. 4½, or 7 & 2; pb. lg. arc £21½,	Flat rat + & max.	1,527,893	*Oa m lamps supp l ed free for street lighting. Data		110
	420 mtl.					inc. £2.0.8*; pr. 2 & 1½	demand		to Mar. 31, 1908		
90,403	96 arc, 12	99=279½ H.P.	..	2,976 KW.	9.9	Lg. 5½, or 7 & 3½ (arc 4½); pb.	Flat rate, max. de-	1,253,338	*Purchased from Company in 1900. Data to 1908 ..		111
993 KW.)	mtl.					lg. arc £23 p.a.; pr. 2½ to 1	mand, & 2-rate mtr.				
5,709*	200 arc, 84	76=224½ H.P.	80=2,000 H.P.	3,519 KW.	5.2	Lg. 5 & 2, or 3½; pb. lg. arc £18;	Max. dem , fla , sl.	2,116,000	Lighting and traction. *Including heaters. Data to		112
524 KW.)	cbn., 25 mtl.					pr. 2 & 1½; tr. 1.5	scale, co ntract, etc.	(1909)	Mar. 31, 1908		
3,483	24 arc, 403×2	..	..	166 KW.	103	Lg. 4½ & 8/- p.a. per 8-C.P.;	Flat rate & con-	130,000	*Bulk supply from Ebbw Vale Steel, Iron & Coal Co.		113
16 KW.)	mtl.					pr. 3½	tract		Data to Mar. 31, 1908		
10,374	2 arc, 423 inc.	2=6 H.P. ..	..	336 KW.	..	Lg. 7 & 2, or 6 to 4; pr. 2½ to 1	Max. demand & flat	232,000	.. ..		114
46 KW.)							rate				
384,547	1,194 arc, 187	2,127=8,793	..	31,237 KW.	6.9	Lg. 3, w. dis. to 25%; pb. lg. arc	Flat rate with	14,490,430	Data to May 15, 1908		115
818 KW.)	cbn.	H.P.				£9, inc. £1 to £2 1s. p.a.; pr. 1½ net.	discount, lg. only	(estimated)			
9,291	24 arc, 22 cbn.,	45=209 H.P.	..	484 KW.	23	Lg. 4; pb. lg. 1 8; pr. 2 to 1	Flat rate & scale ..	214,529	Data to Mar. 31, 1908		116
10 KW.)	46 mtl.										
2,168	..	..	..	72 KW.	..	Lg. 7 & 2; pr. 4 & 1 (ex.peak 1½);	Max. demand & flat	9,472	Bulk supply from North Metropolitan E.P.S. Co.		117
2 KW.)						htg. 2	rate	(3 mo.)	*Engineer in chief, E. T. R. Murray		
11,825	12 arc, 144 inc.,	10=34 H.P...	..	448.5 KW.	..	Lg. 5½ (arc lg. 4); pb. lg. arc	Flat rate	189,688	*Tantalum, £5; inc., £3½ p.a.		118
94 KW.)	238 mtl.					£17½ p.a.*; pr. 2½					
22,486	20 arc, 512 cbn.,	808 H.P. ..	16=855 H.P.	2,150 KW.	..	Lg. 7 & 2, or 4½; pb. lg., arc £20,	Max. dem., flat, sl.	1,258,035	Lg. and tr. *Exc. £12,114 for tramway plant. †Inc. (16		119
49 KW.)	88 N., 7×2 mdn.					p.a.; pr. 2 to 1½; tr. 1.625	sc. & 2-rate, w. dis.		C.P.) £3.17s., N. £5½ p.a. Data to Mar. 31, 1908		
48,363	37 arc, 476	97=851 H.P.	40=1,000 H.P.	2,403 KW. (ex. tr.)	9.25	Lg. 4½; pb. lg. contract; pr. 2½	Flat rate and con-	1,307,412	Lighting and traction. *By company. Bought by		120
512 KW.)	mtl.					to 1½; tr. 1½	tract		T.C. in 1896. Data to Mar. 31, 1908		
440 0	..	11=30 H.P...	..	176.7 KW.	60	Lg. 5; pr. 3	Flat rate	36,500	*Resident engineer, F. C. Mann. Data for 1906-7 ..		121
17,325	45 arc, 86 cbn.,	49=270.5 H.P.	..	835 KW...	18	Lg. 4; pb. lg. arc £15 p.a.; pr.	Flat rate with dis.;	330,000	Data to May 15, 1908		122
777 KW.)	7 Nernst					2 & 1	pr. max. demand	(estimate)			
3.7 KW.)	..	..	..	..	..	Lg. 5; pr. 3	Flat rate	..	*Resident engineer, F. E. Wilkinson. Works started		123
..									Dec., 1906		
	27 arc, 109 inc.	..	..	167 KW.	..	Lg. 6	Flat rate	84,000	.. ..		124
..											
	133 arc, 136	460 H.P. ..	24=600 H.P.	1,336 KW.	..	Lg. 4½ net; pb. lg. arc £16; pr.	Flat rate, sl. scale &	763,895	Lighting and traction. Supply to Kearsley, and light		125
11,318	inc.					2½ to ⅞; tr. 1.5	contract		railway to Pendlebury		
77 KW.)	10 arc, 20 cbn.,	10=30 H.P...	..	207 KW.	..	Lg. 6 to 4½; pr. 3 to 1½ . ..	Sliding scale ..	109,220	Gas power. Data for 1906-7		126
5,200	25 mtl., 90 N.										
73 KW.)	40 arc, 10	15=22 H.P.	..	300 KW.	..	Lg. 8 & 6½; pb. lg. 3½; pr. 6 to	Flat rate & sliding	86,724†	* Undertaking leased to Co. by Felixstowe & Walton		127
8,000	mtl.					4; htg. 3	scale		U.D.C. †March 31, 1906.		
37 KW.)	..	..	..	..	..	Lg. 4½ to 4; pb. lg. inc. 50s. to	Scale	..	*Distribution station; supply from Hebburn		128
..						58s.; pr. 2½ to 1½					
7,000	170 arc & inc.	2=5 H.P.	700 H.P. ..	917 KW.	..	Lg. 4; pr. 4; tr. 1½ & 1 ..	Flat rate & contract	..	Lighting & traction. Water power		129
33 KW.)											
37,933	2,644 inc.	35=110 H.P.	..	1440.5 KW	..	Lg. 6 & 3, or 4½; pb. lg. inc. £3	Flat rate, max.	700,100	.. ..		130
34.5 KW.	(equiv. 8-C.P.)					p.a.; pr. 2	demand & cont.				
..	6 inc. ..	1=4 H.P. ..	..	..	60 lps. (16 c.p.)	Lg. 6 to 4; pb. lg. & pr., con- tract	Flat rate & contract	..	Water power		131
18,000	21 arc, 600	43=396 H.P.	..	967 KW...	..	Lg. 6 to 3; pb. lg. 4; pr. 3 to	Sliding scale ..	243,000	Data to Mar. 31, 1908		132
00 KW.)	inc.					1½; htg. 1½					
94,400	88 arc, 433 N.	Included in pr. lg.	..	3,210 KW.	10.8	Lg. 6 w. dis; pb. lg. arc £14 & £18; pr. 3	Flat rate	1,270,520	Supply to Sandgate and Hythe at 2,750 v. D.C.		133
147 KW.)	and inc.										
0 (50 KW.)	..	7=15 H.P...	..	217 KW...	10	Lg. 5; pr. 4	Flat rate	10,630	Private Co. from 1899 to 1905. 130-H.P. suction gas plant being installed		134
..									*Bulk supply		135
		..	..	..	..	.. ..	.. .. ..	..			
6,000	6 arc, 60 inc.	2=4 H.P. ..	..	210 KW.	..	Lg. 6½; pb. lg. contract; pr. 1	Flat rate	..	Water power, also part oil		136
00 KW.)											
2,500	..	4=10 H.P. ..	..	93 KW.	..	Lg. 6; pr. 3 to 2	Flat rate	15,000	Gas power		137
38 KW.)											
7,631	10 arc, 258 N.	174=628 H.P.	..	863 KW...	6.4	Lg. 7 & 3, or 6; pb. lg. 2½; pr.	Max. dem., flat, 2-	463,457	Data to Dec. 31, 1907		138
54 KW.)						4 & 1, or 2½	rate and contract				
4,460	19 arc, 140	5=18 H.P. ..	..	199 KW...	8	Lg. 5; pb. lg. contract; pr. 3 ..	Flat rate & contract	182,849	Water power mainly; part gas power. Data to Dec. 31,		139
49 KW.)	inc.						with discounts		1907		
19,500	2 arc, 142 cbn.,	33=90 H.P.	..	679 KW...	– 13†	Lg. 7 & 1½, or 4½ (slot meter 5½);	Max. dem.,flat rate,	530,947	Bulk D.C. supply to Naval Authorities. *3-ph. pr., 173 &		140
85 KW.)	364 mtl.					pb. lg. 1½; pr. 2 to 1½; htg. 1	sl. scale & cont.		397 v. †Dec. due to mtl-fil. lps. Data to Mar. 31, 1908		
83,101	837 arc ..	3,303=19,805	..	47,505 KW.	22.62	Lg. 3½ to 1; pb. lg. arc £14 &	Max. demand, flat	26,332 998	3 stn.; at 2, part supply to sub-stn. 25~ 3-ph. at 6,500 v.		141
437 KW.)		H.P.				£12 p.a.; pr. 1½ to ⅜*	rate and contract		*Spl. rates to very large pr. cons. Data to May 31, 1907		
8,360	45 Nernst ..	173 KW. ..	16=480 H.P.	819 KW...	9.2	Lg. 4½; pr. 2½ & spl.; tr. 1½ ..	Flat rate	531,085	Lighting and traction station. Data to end of 1907 ..		142
78 KW.)											
41,700	175 arc, 12	60=239 H.P.	60	2,257 KW.	15·5	Lg. 6 & 2, or 4; pr. 2 to 1½; htg.	Max. dem., flat rate	1,299,629	Data to Mar. 31, 1907		143
392 KW.)	mtl., 3 Nernst					2; tr. 1	& sl. scale				
22,207	10 arc, 240 inc.,	21=52 KW.	..	792 KW...	11	Lg. 7 & 4, or 6; pb. lg. cont.;	Max. demand, flat	285,918	Data to Dec. 31, 1907		144
040 KW.)	1 N.					pr. 4 & 1½	rate and contract				
1,646	55 inc. ..	1=3 H.P. ..	..	60 KW. ..	..	Lg. 6 & 4, or 1·3 per c.p. p a.;	Max. demand and	4,000	.. ..		145
5 KW.)						pr. 3	. contract				
..	..	..	..	..	..	Lg. 4½; pr. 2, 1½ & 1	Flat rate	..	.. ..		146
33,630	215 arc ..	4,228 H.P. ..	..	4,979 KW.	16.1	Lg. 6 & 1, or 3½ & 3; pb. lg. arc	Max. demand, flat	2,200,000	Data to May 15, 1908		147
21 KW.)						£14 p.a.; pr. 2 to ⅞	rate & sliding scale	(estimated)			
23,654	..	102=350 H.P.	..	1,108 KW.	8	Lg. 7 & 3, or 5; pr. 4 & 1, or 2½,	Max. dem., flat, 2-	289,858	Lighting, free wiring, 6d per lamp per quarter; and hire-		148
38 KW.)						and special	rate & cont.		purchase over 3, 5 or 7 years. Data to Dec. 31, 1907		
..	27 arc ..	10=85 H.P.	40=1,200 H.P.	567 KW.	..	Lg. 7 & 2, or 5; pr. 2-rate, 5	Max. demand, flat,	755,000	Lighting and traction. *Pb. lg. arc £17.5 & £10,		149
						& 1, or 2; tr. 2 to 1½*	2-rate m. & cont.		Nernst £3.7 p.a.		
10,173	201 inc., 45	24=72 H.P.	..	427 KW.	..	Lg. 5 to 3; pb. lg. 3; pr. 2½ ..	Sliding -cale & flat	211,589	.. ..		150
39 KW.)	N., 19 mtl.						rate				
46,988	24 mtl. 78 N.	15=55 H.P...	..	1,618 KW.	..	Lg. 5, or 9 & 1½; pb. lg. 5, less	Flat rate & max.	354,750	Data to Dec. 31, 1907		151
665 KW.)						33⅓% ; pr. 2½	demand				
55,800	50 arc, 2 N., 4	340=4,850*	82=2,250 H.P.	8,580 KW.*	21	Lg. 4 & 1½; pr. 2½ to 1; tr. 1½ to	Max. demand and	3,120,000	Lighting and traction. *Estimated to June 30, 1908 ..		152
760 KW.)*	mtl.	H.P.				0.85	sliding scale				
44,680	80 arc, 58 cbn.,	134=915 H.P.	Max. dem. =	2,401 KW.*	..	Lg. 4; pb. lg. arc £20 p.a.; pr. 2½	Max. dem., flat rate,	1,904,887	Lighting and traction (supply to Tram. Co.). *Also bulk		153
89 KW.)*	22 mtl., 1 N.		252 KW.	(ex. tr.)		to 1½, & 1 (time sw.); tr. 1½ to 1½	sl. scale & cont.		supply to G. C. Ry. Docks. Data to Mar. 31, 1908		
25,141	16 mtl. ..	1,857 H.P.	..	2,695 KW.	5.5	Lg. 7 & 3, or 6, 5½; pb. lg. inc. £2½	Max. demand & flat	1,045,300	Two stations, one gas power. 2,600 v. D.C. to sub-		154
38 KW.)						p.a.; pr. 4 & 1½, or 2½, 2; htg. 2	rate		stations. Data to Dec. 31, 1907		
30,000	1 arc, 6 mtl.	55=250 H.P.	..	1,226 KW.	19	Lg. 7 to 5; pb. lg. cont.; pr. 4	Flat rate, 2-rate	804,859	Part oil power (Diesel engines). Data to Dec. 31, 1907		155
000 KW.)						to 2½; discount 1d. per unit.	mtr. & contract				
06,235)	11 arc, 78 cbn.,	864=1,700 H.P	See other	5,052 KW.	11.4	Lg. 4 to 3; pb. lg. 3; pr. 2 to ⅞;	Flat rate & sliding	5,160,888	Lighting and traction (A.C. to sub-stations, 3-ph., 5,500		156
41 KW.	4 mtl., 2 N.		Table.			tr. 1½	scale		v., 25~)		
4,401	66 arc, 8 N.	93=430 H.P.	..	938 KW...	25.9	Lg. 4; pr. 2 & 1	Max. demand & flat	393,596	Data to Dec. 31, 1907		157
0 KW.)							rate				
13,980	124 arc, 246	62=372 H.P.	240 B.H.P...	696 KW. (ex. tr.)	51	Lg. 4; pb. lg. £12; pr. 2 & 1½	Flat rate with dis.	583,567	Lighting and traction. Data to Mar. 31, 1908		158
9 KW.)	cbn., 1 Nernst										
2,882	71 arc, 412 cbn.	99=603½ H.P.	..	2,088 KW.	14.5	Lg. 6, 4½, 3, 2 & 1; pb. g. average	M. dem., fl. r. (pr.), 2-	1,420,000	Small auxiliary plant at destructor works. Data approx.		159
212 KW.)	(posts), 1 N.	& 30 fans				1.8; pr. 3, 1, ⅜ & ½	rate m., t. sw. & cont.		to May 1908, otherwise to Dec. 1907		
76,132	58 arc, 222 cbn.,	94=394 H.P.	..	2,923 KW.	4.3	Lg. 6 & 2, or 5; pb. lg. 1½; pr.	Max. demand, flat	1,203,179	Data to March 31, 1908		160
37 KW.)	124 mtl., 27 N.					2 & 1½	ra e & contract				
33,042	..	..	..	1,101 KW.	7	Lg. inc. 7 & 4½, arc 7 & 1; pr 4	Max. demand ..	378,583	Data to Dec. 31, 1907		161
001 KW.						& 1½; ch. 6					
2,000	52 arc, 104 inc.	8=54 H.P. ..	..	..	..	Lg. 4; pb. lg. 3; pr. 2½ to 1½ ..	Flat rate & scale..	117,168	.. ..		162
7 KW.)											
41,515	105 arc, 10	18=56 H.P.	..	1,517 KW.	..	Lg. 6, or 6 & 2½ (spl.); pb. lg.	Flat rate and spl.	958,032	D ata for 1906-7		163
84 KW.)	inc.					arc £20 p.a.; pr. 3	max. demand				
14,916	12 arc, 3 cbn.,	722 KW. ..	..	1,259 KW.	..	Lg. 5 & 3, or 4 (mills); pb. lg.	Max. dem., flat rate,	894,981	D ata to Dec. 31, 1907		164
97 KW.)	433×2 mtl.					about 1.25; pr. 2½ to 0.9	sl. scale & cont.				
8,230	10 arc, 435 inc.,	1,920 H.P. ..	..	1,128 KW.	..	Lg. 3½; pr. 2½ to 1½	Flat rate & max.	326,962	*A.C. transformed to suit consumers		165
74 KW.)	21 Nernst						demand				
4,500	36 mtl. ..	17=60 H.P...	..	167 KW...	12	Lg. 5; pb. lg. 3; pr. 2	Flat rate with dis-	67,000	Data to Mar. 31, 1908		166
50 KW.)							count				
10,932	10 arc, 180 cbn.	85=588 H.P.	400 KW. ..	1,413 KW.	3.3	Lg. 4 w. dis.; pb. lg. 1½; pr. 2 to	Flat rate & sliding	703,198	Lighting and traction. Data to Mar. 31, 1908		167
54 KW.)	10 mtl., 20 N.					1; tr. 2. Sp. to large cons	scale, w. dis.				
21,100	4 arc ..	28=223 H.P.	..	899 KW.	14.5	Lg. 4½; pr. 3 to 1	Flat rate & sliding	286,891	Data to Mar. 25, 1908		168
38 KW.)							scale with dis.				
8,673	10 arc, with	7=59 H.P.	..	348 KW.	..	Lg. 7 & 2 (max. 5); pb. lg. arc	Max. demand and	147,621	*E. T. R. Murray, ch. eng. †Bulk supply from North		169
9 KW.)	20 inc.					£14½ p.a.; pr. 4½ & 1½	flat rate		Met. El. Supply Co., Ltd.		
20,878	51 arc, 73 cbn.	38=162 H.P.	..	892 KW.	31.5	Lg. 5 w. dis. to 20%; pb. lg. 2.7;	Flat rate with dis-	469,676	Station run in conjunction with 6-cell destructor. Data		170
96 KW.)	193 mtl.					pr. 2, 1½, 1½	counts		to Dec. 31, 1907		
1,560	..	9=43½ H.P...	..	91 KW. ..	..	Lg. 5; pr. 2	Flat rate with dis-	46,589	Lg. & tr. Consumers doubled wt. inc. demand; due to		171
2 KW.)							counts		mtl.-fil. lps. Data to Dec. 31, 1907		
5,615	4 arc ..	54=179½ H.P.	16=400 H.P.*	370 KW. (ex. tr.)	30	Lg. 6 & 3, or 4½; pb. lg. con-	Max. demand, flat	603,307	Lighting and traction. *Number uncertain; cars sup-		172
95 KW.)	18 flame arc,	20=105 H.P.	..	..	..	Lg. 7 & 2; pb. lg. arc £16½, inc.	Max. demand, sliding	330,604	plied by Bury & Rochdale. Data to Mar. 31, 1908		
1,225	163 inc.		..	472 KW.	..	£3 p.a.; pr. 4½ & 1½	scale & contract		Part bulk supply from North Metropolitan E. P. S. Co.		173
4 KW.)						tract; pr. 2½ & 1½; tr. 1.3	rate and contract		*E. T. R. Murray, ch. eng.		
6,897	12 arc, 14×2	147=578 H.P.	..	1,598 KW.	4.1	Lg. 5 & 2; pb. lg. arc £13, N.	Max. dem., flat rate,	777,734	Data to Dec. 31, 1907		174
3 KW.)	mtl., 352 N.					£3; pr. 4 & 1, or 2½	2-rate, cont. & spl.				
1,540	..	6=12 H.P. ..	..	147 KW.	..	Lg. 8; pr. 4	Flat rate	80,000	Part oil power. Further 75 KW. on order		175
0 KW.)											
2,827	..	..	..	95 KW.	..	Lg. 5; pr. 3	Flat rate	94,153.	*Resident Engineer, Geo. T. [illegible]		
4 KW.)											
5,346	9 arc, 452 cbn.	8=5½ H.P. ..	..	253 KW...	23	Lg. 5; pb. lg. 3; pr. 3	Flat rate	135,887	Data to Mar. 31, 1908 ..		
2 KW.)											

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	50~, 1-ph.	2,150	1,006	..	£121,382	75,123 (3,537 KW.)	58 arc, 225 c 124 mtl., 27
161	HARROW	Harrow Electric Light and Power Co., Ltd.	1896	J. A. Horsley ..	230 & 440	Direct ..	554	322	66 KW.	£69,813	38,042 (1,101 KW.)	..
162	HARTLEPOOL	Northern Counties Electricity Supply Co., Ltd.	1904	C. W. Fairweather (Gen. Man.)	230 & 430	Direct ..	200	80	100 KW.	..	2,000 (67 KW.)	52 arc, 104 i
163	HASTINGS	Hastings Corporation ..	1882	R. F. Ferguson	200 & 400	100~, 1-ph.	1,850	700 5	30 KW.	£160,428	41,515 (1,384 KW.)	105 arc, inc.
164	HAWICK	Urban Electric Supply Co., Ltd.	1901	A. N. Rye ..	240 & 480	Direct ..	600	445	50 KW.	£64,918	14,916 (497 KW.)	12 arc, 3 cb 433 × 2 mt
165	HEBBURN	Northern Counties Electricity Supply Co., Ltd.	1903	C. W. Fairweather	230 & 460*	Direct & 40~, 3-ph.	1,900	935	500 A.H.	£70,709	8,230 (274 KW.)	10 arc, 435 i 21 Nerns
166	HEBDEN BRIDGE ..	Hebden Bridge Urban District Council	1904	J. W. Garside ..	240 & 480	Direct ..	215	120	500 A.H.	£11,500	4,500 (150 KW.)	36 mtl.
167	HECKMONDWIKE ..	Heckmondwike Urban District Council	1901	G. H. Carter ..	230 & 460 tr. 550	Direct ..	975	674	300 KW.	£40,000	10,932 (334 KW.)	10 arc, 180 c 10 mtl., 20
168	HEREFORD	Hereford Corporation	1899	W. T. Kerr ..	220 & 440	Direct ..	810	310	50 KW.	£39,350	21,100 (633 KW.)	4 arc
169	HERTFORD	North Metropolitan Elec. Pr. Distribution Co., Ltd.	1901	J. M. Bowman*	230 & 460	Direct ..	300†	145	40 KW.	£9,520 dist.)	8,678 (289 KW.)	10 arc, wi 20 inc.
170	HESTON AND ISLEWORTH	Heston and Isleworth Urban District Council	1904	Percy E. Rycroft	240 & 480	Direct ..	500	334	200 KW.	£56,338	20,878 (696 KW.)	51 arc, 73 cb 193 mtl.
171	HEXHAM	Hexham and District Electric Supply Co., Ltd.	1906	Wilfred Hall (Cons. Eng.)	120 lg., 220 & 440 pr.	40~, 3-ph.	100	36	..	£8,484	1,560 (52 KW.)	..
172	HEYWOOD	Heywood Corporation ..	1903	Jas. Scott ..	200 & 400 tr 500	Direc ..	520	92	100 KW.	£17,631	6,615 (220·5 KW.)	4 arc 18 flame ar
173	HIGH BARNET	North Metropolitan Elec. Pr. Distribution Co., Ltd.	1900	H. Bernard Sale*	230 & 460	Direct ..	500	300	..	£27,617	11,225 (374 KW.)	163 inc.
174	HIGH WYCOMBE ..	Wycombe (Borough) Electric Light & Power Co., Ltd.	1898	W. E. Brandreth	210 & 420	Direct ..	830	523	110 KW.	£99,661	28,897 (963 KW.)	12 arc, 14 × mtl., 352 N.
175	HINDHEAD AND DIST.	Hindhead & District Electric Light Co., Ltd.	1900	T. B. Reader ..	220 & 440	Direct ..	100	54	27 KW.	£15,000	4,500 (150 KW.)	..
176	HITCHIN	Electric Supply Corporation, Ltd.	1903	K. A. Scott-Moncrieff*	240 & 480	Direct ..	200	47	77 KW.	£17,000	2,827 (94 KW.)	..
177	HOLYHEAD	Holyhead Urban District Council	1904	P. Williams ..	200 & 400	Direct ..	220	149	240 KW.	£21,405	6,346 (212 KW.)	9 arc, 452 c
178	HONLEY	Honley Urban District Council	1904	Harry Marsden Gen. Man.)	200	Direct ..	75	26	..	£3,100	2,400 (80 KW.)	2 arc, 99 inc
179	HORNSEY	Hornsey Corporation	1903	N. Stanliand ..	240 & 480	Direct ..	1,300	665	250 KW.	£137,866	68,797 (2,293 KW.)	58 arc, 123 i
180	HORSHAM	Horsham Urban District Council	1902	J. B. Morgan ..	230 & 460	Direct ..	400	178	115 KW.	£28,320	14,100 (470 KW.)	21 arc, 30 cb 250 mtl.
181	HOVE (ALDRINGTON) ..	Hove Corporation	1905	G. M. Harris ..	220 & 440	Direct ..	*	16.5	..	£8,673	3,540 (118 KW.)	4 mtl.
182	HOVE	Hove Electric Lighting Co., Ltd.	1892	C. B. Smith ..	220	Direct ..	1,608	984	36 KW.	£162,423	9,580 (3,219 KW.)	..
183	HOYLAKE & W. KIRBY	Hoylake & W. Kirby Urban District Council	1901	C. J. Turner ..	230	50~, 1-ph.	625	380	300 A.H.	£52,019	46,222 (1,341 KW.)	3arc, 429 cb 50 mtl., 8 N
184	HUDDERSFIELD ..	Huddersfield Corporation ..	1893	A. B. Mountain	100, 200, & 400*	100~, 1 ph. 50~, 3-ph	3,750 1 ph. 5,750 3-ph.	2,036	..	£176,239	160,152 (5,338 KW.)	39 arc, 48 in 4 N.
185	HULL	Hull Corporation	1898	H. Bell	220 & 440	Direct ..	6,454	4,724	438 KW.-hrs.	£354,977	204,254 (6,097 KW.)	20 arc, 4 Nernst
186	ILFORD	Ilford Urban District Counci	1901	A. H. Shaw ..	230 & 460 tr. 500	Direct ..	2,600	1,604	200 KW.	£157,272	69,517 (2,317 KW.)	101 arc, 99 cbn., 458 m
187	ILFRACOMBE	Ilfracombe Electric Light & Power Co., Ltd.	1903	A. A. Jenkins ..	240 & 480	Direct ..	330	169	8½ KW.	£32,484	12,738 (425 KW.)	..
188	ILKESTON	Ilkeston Corporation	1903	A. C. Gilbert ..	230 & 460 tr. 500	Direct ..	*	..	..	£16,598	39,590 (1,32 KW.)	20 arc, 200 86 inc.
189	INCLETON (YORKS) ..	Ingleton Electric Lighting & Power Co., Ltd.	1900	D. Tattersall ..	100 & 200	Direct ..	29	22	12½ KW.	£3,000	1,90 (63 KW.)	36 inc.
190	INVERNESS	North of Scotland Electric Light & Power Co., Ltd.	1905	E. J. Williams..	240 & 480	Direct ..	330	183	100 KW.	£20,451	7,917 (264 KW.)	..
191	IPSWICH	Ipswich Corporation	1903	F. Ayton ..	230 & 460	Direct ..	1,511	706	210 KW.	£84,632	31,779 (1,059 KW.)	..
192	JEDBURGH	Electric Supply Corporation Ltd.	1903	K. A. Scott-Moncrieff*	225 & 450	Direct ..	66	26	35 KW.	£13,000	1,786 (59.5 KW.)	9 arc, 12 cbn 102 Nernst
193	KEIGHLEY	Keighley Corporation	1901	J. M. Smyth ..	230 & 460, tr. 500	Direct ..	740	380	100 KW.	£57,400	10,000 (333 KW.)	18 arc, 24 cb 48 N.
194	KENDAL	Kendal Corporation	1902	John A. T. Barnes	220 & 440	Direct ..	109.5	66	40 KW.	£14,011	4,815 (160.5 KW.)	..
195	KESWICK	Keswick Electric Light Co., Ltd.	1890	W. Jackson ..	100	75~, 1-ph.	120	60	..	£18,761	..	3 arc, 20 inc
196	KETTERING	Kettering Urban District Council	1904	W. A. Walker ..	230 & 460	Direct ..	460	310	70 KW.	£49,768	17,859 (595 KW.)	30 arc, 82 mt 202 N.
197	KEYNSHAM & KINGSWOOD	Keynsham Electric Light & Power Co., Ltd.	1891	G. J. T. J. Parfitt	230	Direct ..	75	55	50 KW.	£4,350	3,570 (119 KW.)	6 Nernst, 11 inc.
198	KIDDERMINSTER ..	Kidderminster & District Elec. Ltg. & Traction Co., Ltd.	1900	A. Charlton ..	230 & 460	Direct ..	1,550	575	220 KW.	£45,774	19,961 (665 KW.)	..
199	KILDARE	Naas Rural District Council	1905	H. Rylance ..	200	Direct ..	32	..	..	£3,300	..	..
200	KILLARNEY	Kerry Electric Supply Co., Ltd.	1898	Valentine Ryan	00	100~, 1-ph.	160	52	..	£7,000	4,000 (133 KW.)	..
201	KILMACOLM	Kilmalcolm Electric Lighting Co., Ltd.	1903	James Brown ..	240 & 480	Direct ..	50	44	20 KW.	£10,000	8,200 (273 KW.)	10 mtl.
202	KILMARNOCK	Kilmarnock Corporation ..	1904	A. H. Burbidge	240 & 480	Direct ..	755	547	60 KW.	£43,556	17,503 (583 KW.)	50 arc
203	KING'S LYNN	King's Lynn Corporation ..	1899	J. Pilling ..	200 & 400	Direct ..	680	377	60 KW.	£49,000 (approx.)	21,045 (703 KW.)	10 arc, 362 cbn 100 mtl., 36
204	KINGSTON-UPON-THAMES	Kingston-upon-Thames Corporation	1893	J. E. Edgcome ..	105	77~, 1-pn.	860	574	..	£99,651	39,100 (1,304 KW.)	76 arc*, 20 cbn., 35 mtl
205	KIRKCALDY	Kirkcaldy Corporation ..	1902	O. F. Francis ..	230 & 460, tr. 500	Direct ..	1,090	723	..	£63,899	19,520 (651 KW.)	104 arc, 208 in
206	LANCASTER	Lancaster Corporation ..	1893	W. A. Tester ..	230 & 460, tr. 525	Direct ..	1,000	700	..	£68,221	43,556 (1,452 KW.)	41 arc, 84 cbn
207	LARNE	Larne Electric Light Works, Ltd.	1891	M. G. Smyth ..	105 & 210	100~, 1-ph.	150	72	..	..	2,350 (78 KW.)	14 arc, 136 in
208	LEAMINGTON	Midland Electric Light & Power Co., Ltd.	1887	T. W. E. Jones	115 & 230	Direct ..	590	280	72 KW.	..	20,180 (673 KW.)	1 arc
209	LEATHERHEAD ASHTEAD & MICKLEHAM	Leatherhead & District Electricity Co., Ltd.	1902	H. Leslie Dixon	220 & 440	Direct ..	150	86	00 A.H.	£32,000	9,856 (328.5 KW.)	..
210	LEEDS	Leeds Corporation	1893	H. Dickinson ..	100, 200 & 400	50~, 1-ph. & 3-ph.	12,740	8,300	..	£878,748	323,628 (10,788 KW.)	644 arc
211	LEEK	Leek Urban District Council..	1904	R. M. Carr ..	230 & 460	Direct ..	355	110	60 KW.	£15,747	5,900 (198 KW.)	..
212	LEICESTER	Leicester Corporation . ..	1894	A. Colson ..	100 & 200	50~, 1 ph.	3,400	2,219	..	£245,131	152,152 (5,072 KW.)	..
213	LEIGH	Leigh Corporation	1899	Arthur T. Smith	220 & 440	Direct ..	760	423	132 KW.	£44,736	18,414 (614 KW.)	..
214	LEITH	Leith Corporation	1899	A. P. Ruther'ord	230 & 460, tr. 500	Direct ..	2,880	1,875	116 KW.	£125,000	71,275 (2,376 KW.)	297 arc
215	LEWES	Lewes & District Electric Supply Co. Ltd.	1901	C. F. Butler ..	230 & 460	Direct ..	210	140	20 KW.	£25,044	9,596 (320 KW.)	..
216	LEYTON	Leyton Urban District Council	1896	F. Harman Lewis	150 & 300 tr. 500	Direct ..	2,700	944 lg. 858 tr.	90 KW.	£170,289	58,825 (1,961 KW.)	79 arc, 1,27 cbn.
217	LIMAVADY	Limavady Power & Light Works	1897	E. J. S. Ritter ..	110 & 220	100~, 1-ph.	240	35	..	..	1,000 (33 KW.)	..
218	LIMERICK	Limerick Corporation ..	1902	P. T. MacNamara	230 & 460	Direct ..	860	200	96 KW.	..	..	60 arc
219	LINCOLN	Lincoln Corporation	1898	Stanley Clegg ..	230 & 460 tr. 500	Direct ..	1,368	784 lg. 135 tr.	70 KW.	£64,726	37,494 (1,250 KW.)	34 arc, 24 cbn 66 mtl., 7 N.
220	LIVERPOOL	Liverpool Corporation ..	1883	A. Clough (Res.) A. B. Holmes (Con.)	230 & 460, tr. 500	Direct ..	35,300	17,525	..	£2,004,031	617,610 (20,587 KW.)	193 arc, 342 .n

~=cycles per second; lg. = lighting; pb. lg. = public lighting; pr. = power; htg. = heating; in c. = incandescent; cbn. = carbon; mtl. = metal filament; N. = Nernst; A. = amperes

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A 1 A A

A 1 ACCUMULATOR ACID.

Sulphuric

70,123 (2,537 KW.)	39 arc, 222 cbn., 194 mtl., 37 N.	94=394 H.P.	..	2,923 KW.	4.3	L.g., pr. 3, 4, ½ & ¾	rate m., t. sw. & cont.		to May 1908, otherwise to Dec. 1907	
38,042 (1,101 KW.)	..	..	..	1,101 KW.	7	Lg. 6 & 2, or 5; pb. lg. 1½; pr. 2 & 1½	Max. demand, flat ra e & contract	1,906,179	Data to March 31, 1908	160
2,000 (67 KW.)	52 arc, 104 inc.	8=54 H.P. ..	..	..	..	Lg. inc. 7 & 4½, arc 7 & 1; pr 4 & 1½; ch. 6	Max. demand ..	378,533	Data to Dec. 31, 1907	161
41,515 (1,384 KW.)	105 arc, 10 inc.	18=56 H.P.	..	1,517 KW.	..	Lg. 4; pb. lg. 3; pr. 2½ to 1½ ..	Flat rate & scale..	117,168	.. ..	162
14,916 (497 KW.)	12 arc, 3 cbn., 433 × 2 mtl.	722 KW. ..	..	1,359 KW.	..	Lg. 6, or 6 & 2½ (spl.); pb. lg. arc £20 p.a.; pr. 3	Flat rate and spl. max. demand	958,032	D ata for 1906-7	163
8,230 (274 KW.)	10 arc, 435 inc., 21 Nernst	1,220 H.P. ..	..	1,128 KW.	..	Lg. 5 & 3, or 4 (mills); pb. lg, about 1.25; pr. 2½ to 0.9	Max. dem., flat rate, sl. scale & cont.	894,981	D ata to Dec. 31, 1907	164
4,500 (150 KW.)	36 mtl. ..	17=60 H.P. ..	..	167 KW. ..	12	Lg. 3½; pr. 2½ to 1¼	Flat rate & max. demand	326,962	*A.C. transformed to suit consumers	165
10,932 (364 KW.)	10 arc, 180 cbn. 10 mtl., 20 N.	85=588 H.P.	400 KW. ..	1,413 KW.	3.3	Lg. 5; pb. lg. 3; pr. 2	Flat rate with discount	67,000	Data to Mar. 31, 1908	166
21,100 (633 KW.)	4 arc ..	28=223 H.P.	..	899 KW.	14.5	Lg. 4 w. dis.; pb. lg. 1½; pr. 2 to 1; tr. 2. Sp. to large cons	Flat rate & sliding scale, w. dis.	703,198	Lighting and traction. Data to Mar. 31, 1908	167
8,673 (289 KW.)	10 arc, with 20 inc.	7=59 H.P.	..	348 KW.	..	Lg. 4½; pr. 3 to 1	Flat rate & sliding scale with dis.	286,391	Data to Mar. 25, 1908	168
20,878 (696 KW.)	51 arc, 78 cbn. 193 mtl.	38=162 H.P.	..	892 KW. ..	31.5	Lg. 7 & 2 (max. 5); pb. lg. arc £14½ p.a.; pr. 4½ & 1½	Max. demand and flat rate	147,621	*E. T. R. Murray, ch. eng. †Bulk supply from North Met. El. Supply Co., Ltd.	169
1,560 (52 KW.)	..	9=43½ H.P. ..	..	91 KW. ..	..	Lg. 5 w. dis. to 20%; pb. lg. 2.7; pr. 2, 1½, 1½	Flat rate with discounts	469,676	Station run in conjunction with 6-cell destructor. Data to Dec. 31, 1907	170
6,615 (220·5 KW.)	4 arc ..	54=179½ H.P.	16=400 H.P.†	870 KW. (ex. tr.)	30	Lg. 5; pr. 2	Flat rate with discounts	48,589	Lg. & tr. Consumers doubled wt. inc. demand; due to mtl.-fil. lps. Data to Dec. 31, 1907	171
11,225 (374 KW.)	18 flame arc, 163 inc.	20=106 H.P. ..	..	472 KW.	..	Lg. 6 & 3, or 4½; pb. lg. con- Lg. 7 & 2; pb. lg. arc £16½, inc. £3 p.a.; pr. 4½ & 1½ tract; pr. 2½ & 1½; tr. 1.3	Max. demand, flat Max. demand, sliding scale & contract rate and contract	603,307 330,604	Lighting and traction. *Number uncertain; cars supplied by Bury & Rochdale. Data to Mar. 31, 1908 Part bulk supply from North Metropolitan E. P. S. Co. *E. T. R. Murray, ch. eng.	172 173
28,897 (963 KW.)	12 arc, 14 × 2 mtl., 352 N.	147=538 H.P.	..	1,598 KW.	4.1	Lg. 5 & 2; pb. lg. arc £13, N. £3; pr. 4 & 1, or 2½	Max. dem., flat rate, 2-rate, cont. & spl.	777,764	Data to Dec. 31, 1907	174
4,500 (150 KW.)	..	6=12 H.P. ..	..	147 KW.	..	Lg. 8; pr. 4	Flat rate	80,000	Part oil power. Further 75 KW. on order	175
2,827 (94 KW.)	..	..	..	95 KW.	..	Lg. 5; pr. 3	Flat rate	24,152	*Resident Engineer, Geo. T. Laverty. Data for 1906-7	176
6,346 (212 KW.)	9 arc, 452 cbn.	8=5½ H.P. ..	..	253 KW. ..	23	Lg. 5; pb. lg. 3; pr. 3	Flat rate	125,287	Data to Mar 31, 1908	177
2,400 (80 KW.)	2 arc, 99 inc.	3=6 H.P. ..	..	87 KW.	..	Lg. 4½ (less 8½%); pb. lg. 3; pr. 2½	Flat rate with discount	27,114	.. ..	178
68,797 (2,293 KW.)	58 arc, 123 inc.	22=28½ KW.	..	2,331 KW.	35	Lg. 7 & 2, or 5 to 3; pb. lg. 3; pr. 2½ & 1, or 2	Max. demand and flat rate w. rebates	794,212	Data to Mar. 1908	179
14,100 (470 KW.)	21 arc, 30 cbn., 250 mtl.	14=30 H.P.	..	492 KW. ..	16	Lg. 7 & 3, or 6; pb. lg. 4; pr. 3 & 1½	Max. demand and flat rate	190,000 approx.	Data to Mar. 31, 1908	180
3,540 (118 KW.)	4 mtl. ..	6=12 H.P. ..	..	127 KW ..	37	Lg. 7 & 4, or 5; pb. lg. 1.5; pr. 5 & 2, or 3½ (2, time-switch).	Max. demand, flat rate & time sw tch	22,707	*Bulk supply from Brighton Corporation. Data to Mar. 31, 1908	181
9,580 (3,219 KW.)	..	94=349 H.P. Rad.=150 KW	..	3,480 KW.	6.8	Lg. 5½, or 7 & 4; pr. 3 & 1½ ..	Flat rate and max. demand	1,019,469	Data to Dec. 31, 1907	182
46,222 (1,341 KW.)	3arc, 429 cbn., 50 mtl., 8 N.	10=30 H.P.	..	1,691 KW.	12	Lg. 7 & 3, or 5½; pb. lg. 3½; pr. 3 & 1½, or 2	Max. dem., flat, sl. scale, 2-rate & t.s.	401,602	.. ..	183
160,152 (5,338 KW.)	39 arc, 48 inc. 4 N.	311=1,120 H.P.	..	6,583 KW.	12	Lg. 4; pb. lg. arc £17½., inc. 33s. p.a., pr. 2 & 1 (3-ph., 1 w. dis.)	Flat rate w. dis., sl. scale, cont. & spl.	2,070,023	*100 and 200 volts, 1-ph.; 400 volts, 3-ph. Data to May, 1908	184
204,254 (6,097 KW.)	20 arc, 42 Nernst	5,543 H.P.	..	10,250 KW.	6	Lg. 5 & 1½, or 4; pb. lg. arc £22, N. £6; pr. 2 to 1	Max. dem., flat, sl. sc. w. dis., cont., t. sw.	5,306,726	Data to Mar. 31, 1908	185
69,517 (2,317 KW.)	101 arc, 992 cbn., 453 mtl.	90=529 H.P.	44=1,100 H.P.	4,077 KW.	10	Lg. 6 & 1, or 3½; pb. lg. arc £18 & £9* p.a.; pr. 2 to 1, or 3 & 1; tr. 1½	Max. demand, flat rate, & sl. scale	3,046,723	Lighting and traction. *Incandescent, £3 12s. 6d. p.a.; 32 C.P. cbn. or 50 C.P. mtl. Data to Mar. 31, 1908	186
12,738 (425 KW.)	..	43=103 H.P.	..	527 KW.	7	Lg. 7 & 3, or 6; pr. 4 & 1½, or 2½	Max. demand and flat rate	132,427	Data to Dec. 31, 907	187
39,590 (1,320 KW.)	20 arc, 200 36 inc.	..	26=650 H.P.	1,355 KW.	3	Lg. 3; pb. lg. 3; pr. 2 to 1½; tr. 1	Flat rate	603,094	*Supply in bulk from Derby & Notts Electric Power Co. Data to Mar. 31, 1908	188
1,900 (63 KW.)	36 inc. ..	8=26 H.P. ..	..	85 KW. ..	..	*Lg. 6; pb. lg. 2.9; pr. 3 to 1 ..	Flat rate and contract, pr. sl. scale	19,060	Water power. Data to Dec. 31, 1907	189
7,917 (264 KW.)	..	49=218 H.P.	..	489 KW. ..	92	Lg. 7 & 3, or 6; pr. 4 & 1½, or 2½	Max. demand and flat rate	144,069	Data to Dec. 31, 1907	190
31,779 (1,059 KW.)	..	320 H.P. ..	72=1,800 H.P.	3,417 KW.	30	Lg. 4 less 5% cash; pr. 2 to 1½; tr. 1½	Flat rate	1,261,614	Lighting and traction. Data to Mar. 31, 1908	191
1,786 (59.5 KW.)	9 arc, 12 cbn., 102 Nernst	7=24 H.P.	..	101 KW.	32	Lg. 6; pb. lg. 3; pr. 3	Flat rate	30,000	*Resident engineer J. H. Dennison. Data for 1906-7 ..	192
10,000 (333 KW.)	18 arc, 24 cbn., 48 N.	108=430 H.P.	24=720 H.P.	1,366 KW.	6.8	Lg. 7 & 2, or 4½ to 4; pb. lg. 1.78; pr. 2 to 1; tr. 1.75	Max. dem., flat, sl. scale & cont. w. dis.	522,433	Lighting and traction. Data to June 30, 1907 ..	193
4,815 (160.5 KW.)	..	24=60 H.P.	..	210 KW.	27.8	Lg. 6; pr. 3½ to 1½	Flat rate	46,356	Part gas power	194
..	8 arc, 20 inc.	.. ..	..	207 KW.	..	Lg. 6; pb. lg. contract; pr. 3 ..	Flat rate	53,568	Part water power.	195
17,859 (595 KW.)	30 arc, 82 mtl., 202 N.	95=376 H.P.	..	948 KW. ..	4	Lg. 4½; pb. lg. arc £17, Nernst £5½ p.a.*; pr. 2 to 1	Flat rate & sliding scale	418,489	*£5 5s. all night; £3 3s. half-night. Data to Mar. 31, 1908	196
3,570 (119 KW.)	6 Nernst, 119 inc.	6=26 H.P.	..	151.5 KW.	..	Lg. 6; pb. lg. £226 p.a.; pr. 2 to 2½	Flat rate with discount	58,400	.. ..	197
19,961 (665 KW.)	..	41=919 H.P.	26=680 H.P.	2,319 KW.	10.3	Lg. 7 & 2½ (ave. max. 4½) w. discount; pr. 4½ & 1½	Max. demand w. dis., & 2-rate mr.	1,012,194	Lighting and traction. Data to Dec. 31, 1907	198
..	..	.. ..	.. ..	250 KW.	..	Lg. 5; pr. 2½	Flat rate	..	.. ..	199
4,000 (133 KW.)	..	.. ..	.. ..	150 KW. ..	..	6d. with discounts	Flat rate	..	Part water power	200
8,200 (273 KW.)	10 mtl. ..	4=6 H.P. ..	..	278 KW. ..	14	Lg. 6; pb. lg. £1 p.a.; pr. 4 ..	Flat rate	44,000	Data to Dec. 31, 1907	201
17,503 (583 KW.)	50 arc ..	47=238 H.P.	28=730 H.P.	757 KW. ..	40	Lg. 4½ w. dis.; pb. lg. £880; pr. 2 w. dis.; tr. 1½	Sliding scale and flat rate	675,000	Lighting and traction. Data to May 15, 1908	202
21,045 (703 KW.)	10 arc, 362 cbn., 100 mtl., 36 N.	74=315½ H.P.	..	1,055 KW.	6.6	Lg. 4½ to 4½; pb. lg. 1.83; pr. 3 to 1½; htg. 1½	Flat rate and max. demand*	540,000	Part gas power. *Pr. max. demand; flat rate in day-time. Data to Mar. 31, 1908	203
39,100 (1,304 KW.)	76 arc*, 200 cbn., 35 mtl.	53=219 H.P.	..	1,500 KW.	..	Lg. 5, or 7 & 3; pb. lg. arc £20, 32-C.P. inc. £3½ p.a.; pr. 1½.	Max. demand and flat rate	692,452	*Two 32-C.P. inc. used after midnight. Data to May 7, 1908	204
19,520 (651 KW.)	104 arc, 208 inc.	613½ H.P. ..	44=1,232 H.P.	2,183 KW.	11	Lg. 4½ to 3; pb. lg. arc £12 p.a.; pr. 1½ to ¾; tr. 1½	Sliding scale ..	1,178,223	Lighting and traction. Data to May 15, 1907	205
43,556 (1,452 KW.)	41 arc, 84 cbn. 14 arc, 136 inc.	101=434 H.P.	24=640 H.P.	2,294 KW.	15.7	Lg. 4½; pb. lg. 1½; pr. 2½ with dis.; tr. 1.7	Flat rate, sl. scale. & contract, w. dis.	761,872	Lighting and traction. Max. load recorded reduced, due to metallic-filament lamps. Data to Mar. 25, 1908	206
2,350 (78 KW.)	..	.. ..	.. ..	100 KW. ..	..	Lg. 8 to 1½; pb. lg. 2½ inclusive	Flat rate, contract and special	..	.. ..	207
20,180 (673 KW.)	1 arc ..	36=66.7 H.P.	..	743 KW.	2	Lg. 7 & 2½, or 5½*; pr. 2½ or £5 p. H.P. p.a. & 1½ p.u.	Max. demand, flat rate & time switch*	230,253	*Time switch, 2½d. per unit for 20 hrs. and 6d. for 4 hrs. per day. Data for 1906-7	208
9,856 (328.5 KW.)	..	12=37 H.P.	..	337 KW.	18	Lg. 6½ to 5; pr. 3 to 2½, or £12½ per KW. p.a. & 2d. p.u.	Max. dem., flat, sl. scale, & 2 rate mtr.	101,770	Diesel oil engines. Data to Dec. 31, 1907	209
323,628 10,788 KW.)	644 arc ..	1,479=8,379 H.P.	..	18,458 KW.	9.9	Lg. 4 & 1; pb. lg. 1½; pr. 1½ to 0.8 (less 5%)	Special scale* and max. demand	12,412,861	*Lg., 4d. first 1,000 hrs. use of lamps, 1d. after; pr. max. demand. Data to Mar. 31, 1908	2101
5,800 (193 KW.)	..	20=75 H.P.	..	257 KW.	..	Lg. 7 & 3, or 6 to 3½; pr. 2 to 1½	Max. demand & flat rate; pr. sl. scale	96,698	Gas power.	211
153,152 (5,072 KW.)	..	188=704 H.P.	..	7,400 KW.	..	Lg. 4; pr. 2	Flat rate	2,015,000	.. ..	212
18,414 (614 KW.)	..	156=985 H.P.	..	1,399 KW.	..	Lg. 7 & 2, or 4½; pr. 3 & ¾ (+10% March quarter)	Max. demand & flat rate	764,988	.. ..	213
71,275 (2,376 KW.)	297 arc ..	364=2,885 H.P.	72=2,160 H.P.	5,144 KW. (ex. tr.)	18.4	Lg. 3½; pb. lg. arc £16; pr. 1½; tr. 1	Flat rate with discount	2,521,759 (estimated)	Lighting & traction. *Also 66 radiators=77 KW. Data to April 30, 1908	214
9,596 (320 KW.)	..	14=50½ H.P.	..	370 KW. ..	16.8	Lg. 7 & 2½, or 5; pr. 4½ & 1½, or 2½	Max. demand & flat rate	115,793	Data to Dec. 31, 1907	215
58,825 (1,961 KW.)	79 arc, 1,278 cbn.	65=195 H.P.	120=3,600 H.P.	2,322 KW. (ex. tr.)	7	Lg. 5 & 2, or 4*; pr. 3 & 1, or 1½; tr. 1½	Max. demand & flat rate	3,801,7.2	Lighting and traction. *Pb. lg. arc £21, inc. £4.3.6 (two 40-C.P.) per annum. Data to Mar. 31, 1908	216
1,000 (33 KW.)	..	.. ..	.. ..	33 KW. ..	..	10s. per 8-C.P.	Contract	..	Water power	217
..	60 arc ..	.. ..	.. ..	400 KW. ..	..	Lg. 5; pr. 2	Flat rate	..	Gas power	218
37,494 (1,250 KW.)	34 arc, 24 cbn., 66 mtl., 7 N.	146=1,043 H.P.	16=420 H.P.	2,492.6 KW.	12.6	Lg. 5 & 2½, or 4½ (ch. 4); pr. 2 & 1, or 2½ to 2; tr. 1½	Max. dem., flat w. dis., sl. sc., 2-rate, t.s. & spl.	1,458,822	Data to May 27, 1908	219
617,610 (20,587 KW.)	193 arc, 342 inc.	2,129=8854 H.P.	764=19,100 H.P.	23,590 KW. (ex. tr.)	10.5	Lg. 3½, 3 & 2½; pb. lg. 2; pr. 2, 1½ & 1; tr. 1·050*	Sliding scale & flat rate	34,931,923	Lighting and traction. *Plus 4% for every 1s. paid for coal above 6s. per ton	220

N.=Nernst; A.=amperes; A.H.=ampere-hours; ph.=phase; A.C.=alternating current; D.C.=direct current.

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177	HOLYHEAD	Holyhead Urban District Council	1904	P. Williams	200 & 400	Direct	220	149	240 KW.		(212 KW.)		
178	HONLEY	Honley Urban District Council	1904	Harry Marsden (Gen. Man.)	200	Direct	75	26	..	£3,100	2,400 (80 KW.)	2 arc, 99 inc.	
179	HORNSEY	Hornsey Corporation	1903	N. Stanliand	240 & 480	Direct	1,300	665	250 KW.	£137,866	68,797 (5,293 KW.)	58 arc, 123 inc	
180	HORSHAM	Horsham Urban District Council	1902	J. B. Morgan	230 & 460	Direct	400	178	115 KW.	£28,320	14,100 (470 KW.)	21 arc, 30 cbn 250 mtl.	
181	HOVE (ALDRINGTON)	Hove Corporation	1905	G. M. Harris	220 & 440	Direct		16.5	..	£8,673	3,540 (118 KW.)	4 mtl.	
182	HOVE	Hove Electric Lighting Co., Ltd.	1892	C. B. Smith	220	Direct	1,608	984	36 KW.	£162,423	9 ½,580 (3,219 KW.)	..	
183	HOYLAKE & W. KIRBY	Hoylake & W. Kirby Urban District Council	1901	C. J. Turner	230	50~, 1-ph.	625	330	300 A.H.	£52,019	46,222 (1,341 KW.)	3arc, 429 cbn 50 mtl., 8 N.	
184	HUDDERSFIELD	Huddersfield Corporation	1893	A. B. Mountain	100, 200, & 400	100~, 1 ph. 50~, 3-ph	3,750 1 ph. 5,750 3-ph.	2,036	..	£176,239	160,152 (5,338 KW.)	39 arc, 48 inc 4 N.	
185	HULL	Hull Corporation	1898	H. Bell	220 & 440	Direct	6,454	4,724	438 KW.-hrs.	£354,977	20 ,254 (6,097 KW.)	20 arc, 42 Nernst	
186	ILFORD	Ilford Urban District Counci	1901	A. H. Shaw	230 & 460 tr. 500	Direct	2,600	1,604	200 KW.	£157,272	69,517 (2,317 KW.)	101 arc, 992 cbn., 458 mtl	
187	ILFRACOMBE	Ilfracombe Electric Light & Power Co., Ltd.	1903	A. A. Jenkins	240 & 480	Direct	330	160	8½ KW.	£32,484	12,738 (425 KW.)	..	
188	ILKESTON	Ilkeston Corporation	1903	A. C. Gilbert	230 & 460 tr. 500	Direct			..	£16,598	39,590 (1,32 KW.)	20 arc, 200 36 inc.	
189	INGLETON (YORKS)	Ingleton Electric Lighting & Power Co., Ltd.	1900	D. Tattersall	100 & 200	Direct	29	22	12½ KW.	£3,000	1,90 (63 KW.)	36 inc.	
190	INVERNESS	North of Scotland Electric Light & Power Co., Ltd.	1905	E. J. Williams	240 & 480	Direct	330	183	100 KW.	£20,451	7,917 (234 KW.)	..	
191	IPSWICH	Ipswich Corporation	1903	F. Ayton	230 & 460	Direct	1,511	706	210 KW.	£84,662	31,779 (1,059 KW.)	..	
192	JEDBURGH	Electric Supply Corporation Ltd.	1903	K. A. Scott-Moncrieff	225 & 450	Direct	66	26	35 KW.	£13,000	1,786 (59.5 KW.)	9 arc, 12 cbn., 102 Nernst	
193	KEIGHLEY	Keighley Corporation	1901	J. M. Smyth	230 & 460, tr. 500	Direct	740	340	100 KW.	£57,409	10,000 (333 KW.)	18 arc, 24 cbn 48 N.	
194	KENDAL	Kendal Corporation	1902	John A. T. Barnes	220 & 440	Direct	109.5	66	40 KW.	£14,011	4,815 (160.5 KW.)	..	
195	KESWICK	Keswick Electric Light Co., Ltd.	1890	W. Jackson	100	75~, 1-ph.	120	60	..	£13,761	..	3 arc, 20 inc.	
196	KETTERING	Kettering Urban District Council	1904	N. A. Walker	230 & 460	Direct	460	310	70 KW.	£49,768	17,859 (595 KW.)	30 arc, 82 mtl. 202 N.	
197	KEYNSHAM & KINGSWOOD	Keynsham Electric Light & Power Co., Ltd.	1891	G. J. T. J. Parfitt	230	Direct	75	55	50 KW.	£4,350	3,570 (119 KW.)	6 Nernst, 119 inc.	
198	KIDDERMINSTER	Kidderminster & District Elec. Ltg. & Traction Co., Ltd.	1900	A. Charlton	230 & 460	Direct	1,550	575	220 KW.	£45,774	19,961 (665 KW.)	..	
199	KILDARE	Naas Rural District Council	1905	H. Rylance	200	Direct	32	..	..	£3,300	..	..	
200	KILLARNEY	Kerry Electric Supply Co., Ltd.	1898	Valentine Ryan	00	100~, 1-ph.	160	52	..	£7,000	4,000 (133 KW.)	..	
201	KILMACOLM	Kilmalcolm Electric Lighting Co., Ltd.	1908	James Brown	240 & 480	Direct	50	44	20 KW.	£10,000	8,200 (273 KW.)	10 mtl.	
202	KILMARNOCK	Kilmarnock Corporation	1904	A. H. Burbidge	240 & 480	Direct	755	547	60 KW.	£43,556	17,508 (583 KW.)	50 arc	
203	KING'S LYNN	King's Lynn Corporation	1899	J. Pilling	200 & 400	Direct	680	377	60 KW.	£49,000 (approx.)	21,045 (703 KW.)	10 arc, 362 cbn. 100 mtl., 36 N	
204	KINGSTON-UPON-THAMES	Kingston-upon-Thames Corporation	1893	J. E. Edgcome	105	77~, 1-pn.	860	574	..	£99,551	39,100 (1,303 KW.)	76 arc*, 200 cbn., 35 mtl.	
205	KIRKCALDY	Kirkcaldy Corporation	1902	O. F. Francis	230 & 460, tr. 500	Direct	1,000	723	..	£63,399	19,520 (651 KW.)	104 arc, 208 inc	
206	LANCASTER	Lancaster Corporation	1893	W. A. Tuster	230 & 460, tr. 525	Direct	1,000	700	..	£63,221	43,556 (1,452 KW.)	41 arc, 84 cbn.	
207	LARNE	Larne Electric Light Works, Ltd.	1891	M. G. Smyth	105 & 210	100~, 1-ph.	150	72	..	..	2,350 (78 KW.)	14 arc, 136 inc	
208	LEAMINGTON	Midland Electric Light & Power Co., Ltd.	1887	T. W. E. Jones	115 & 230	Direct	590	280	72 KW.	..	20,180 (673 KW.)	1 arc	
209	LEATHERHEAD ASHTEAD & MICKLEHAM	Leatherhead & District Electricity Co., Ltd.	1902	H. Leslie Dixon	220 & 440	Direct	150	86	00 A.H.	£32,000	9,856 (328.5 KW.)	..	
210	LEEDS	Leeds Corporation	1893	H. Dickinson	100, 200 & 400	50~, 1-ph. & 2-ph.	12,740	8,300	..	£878,748	323,628 (10,788 KW.)	644 arc	
211	LEEK	Leek Urban District Council	1904	R. M. Carr	230 & 460	Direct	255	110	60 KW.	£15,747	5,800 (193 KW.)	..	
212	LEICESTER	Leicester Corporation	1894	A. Colson	100 & 200	50~, 1 ph.	3,400	2,219	..	£245,131	152,152 (5,072 KW.)	..	
213	LEICH	Leigh Corporation	1899	Arthur T. Smith	220 & 440	Direct	760	423	132 KW.	£44,756	18,414 (614 KW.)	..	
214	LEITH	Leith Corporation	1899	A. P. Ruther'ord	230 & 460, tr. 500	Direct	2,830	1,875	116 KW.	£125,000	71,275 (2,376 KW.)	297 arc	
215	LEWES	Lewes & District Electric Supply Co. Ltd.	1901	C. F. Butler	230 & 460	Direct	210	140	20 KW.	£25,044	9,596 (320 KW.)	..	
216	LEYTON	Leyton Urban District Council	1896	F. Harman Lewis	150 & 300 tr. 500	Direct	2,700	944 lg. 858 tr.	90 KW.	£170,239	58,825 (1,961 KW.)	79 arc, 1,278 cbn.	
217	LIMAVADY	Limavady Power & Light Works	1897	E. J. S. Ritter	110 & 220	100~, 1-ph.	240	35	..	..	1,000 (33 KW.)	..	
218	LIMERICK	Limerick Corporation	1902	P. T. MacNamara	230 & 460	Direct	360	200	90 KW.	..	..	60 arc	
219	LINCOLN	Lincoln Corporation	1898	Stanley Clegg	230 & 460 tr. 500	Direct	1,368	784 lg. 135 tr.	70 KW.	£64,726	37,494 (1,250 KW.)	34 arc, 24 cbn. 66 mtl., 7 N.	
220	LIVERPOOL	Liverpool Corporation	1883	A. Clough (Res.) A. B. Holmes (Con.)	230 & 460, tr. 500	Direct	35,300	17,525	..	£2,034,031	617,610 (20,587 KW.)	193 arc, 342 inc	

~=cycles per second; lg. = lighting; pb. lg. = public lighting; pr. = power; htg. = heating; in. = incandescent; cbn. = carbon; mtl. = metal filament; N. = Nernst; A. = amperes;

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(212 KW.)	9 arc, 152 mtl.	8=5½ H.P. ..	..	258 KW. ..	23	Lg. 5; pb. lg. 3; pr. 3	Flat rate	125,287	Data to Mar 31, 1908	177
2,400 (80 KW.)	2 arc, 99 inc.	3=6 H.P. ..	..	87 KW.	..	Lg. 4½ (less 8½%); pb. lg. 3; pr. 2½	Flat rate with discount	27,114	.. ..	178
68,797 (5,293 KW.)	58 arc, 125 inc.	22=28½ KW.	..	2,831 KW.	35	Lg. 7 & 2, or 5 to 3; pb. lg. 3; pr. 2½ & 1, or 2	Max. demand and flat rate w. rebates	794,212	Data to Mar. 1908	179
14,100 (470 KW.)	21 arc, 30 cbn., 250 mtl.	14=30 H.P.	..	492 KW. ..	16	Lg. 7 & 3, or 6; pb. lg. 4; pr. 3 & 1½	Max. demand and flat rate	190,000 approx.	Data to Mar. 31, 1908	180
3,540 (118 KW.)	4 mtl. ..	6=12 H.P. ..	..	127 KW ..	37	Lg. 7 & 4, or 5; pb. lg. 1.5; pr. 5 & 2, or 3½ (2, time-switch).	Max. demand, flat rate & time sw tch	22,707	*Bulk supply from Brighton Corporation. Data to Mar. 31, 1908	181
95,580 (3,219 KW.)	..	94=349 H.P. Rad.=150 KW	..	3,480 KW.	6.8	Lg. 5½, or 7 & 4; pr. 3 & 1½ ..	Flat rate and max. demand	1,019,489	Data to Dec. 31, 1907	182
46,222 (1,341 KW.)	3arc, 429 cbn., 50 mtl., 8 N.	10=30 H.P.	..	1,691 KW.	12	Lg. 7 & 3, or 5½; pb. lg. 3½; pr. 3 & 1½, or 2	Max. dem., flat, sl. scale, 2-rate & t.s.	401,602	.. ..	183
160,152 (5,338 KW.)	39 arc, 48 inc. 4 N.	311=1,120 H.P.	..	6,583 KW.	12	Lg. 4; pb. lg. arc £17½., inc. 33s. p.a., pr. 2 & 1 (3-ph., 1 w. dis.)	Flat rate w. dis., sl. scale, cont. & spi.	2,070,023	*100 and 200 volts, 1-ph.; 400 volts, 3-ph. Data to May, 1908	184
201,254 (6,097 KW.)	20 arc, 42 Nernst	5,543 H.P.	..	10,250 KW.	6	Lg. 5 & 1½, or 4; pb. lg. arc £32, N. £6; pr. 2 to 1	Max. dem., flat, sl. sc. w. dis., cont., t. sw.	5,306,726	Data to Mar. 31, 1908	185
69,517 (2,317 KW.)	101 arc, 992 cbn., 458 mtl.	90=520 H.P.	44=1,100 H.P.	4,077 KW.	10	Lg. 6 & 1, or 3½; pb. lg. arc £18 & £9* p.a.; pr. 2 to 1, or 2 & 1; tr. 1½	Max. demand, flat rate, & sl. scale	3,046,723	Lighting and traction. *Incandescent, £3 12s. 6d. p.a.: 32 C.P. cbn. or 50 C.P. mtl. Data to Mar. 31, 1908	186
12,738 (425 KW.)	..	43=103 H.P.	..	527 KW.	7	Lg. 7 & 3, or 6; pr. 4 & 1½, or 2½	Max. demand and flat rate	182,427	Data to Dec. 31, 907	187
39,590 (1,320 KW.)	20 arc, 200 36 inc.	..	26=650 H.P.	1,355 KW.	3	Lg. 3; pb. lg. 3; pr. 2 to 1½; tr. 1	Flat rate	603,094	*Supply in bulk from Derby & Notts Electric Power Co. Data to Mar. 31, 1908	188
1,900 (63 KW.)	36 inc. ..	8=26 H.P. ..	..	85 KW. ..	..	*Lg. 6; pb. lg. 2.9; pr. 3 to 1 ..	Flat rate and contract, pr. sl. scale	19,000	Water power. Data to Dec. 31, 1907	189
7,917 (264 KW.)	..	49=218 H P. ..	..	489 KW. ..	92	Lg. 7 & 3, or 6; pr. 4 & 1½, or 2½	Max. demand and flat rate	144,069	Data to Dec. 31, 1907	190
31,779 (1,059 KW.)	..	520 H.P. ..	72=1,800 H.P.	3,417 KW.	30	Lg. 4 less 5% cash; pr. 2 to 1½; tr. 1½	Flat rate	1,261,614	Lighting and traction. Data to Mar. 31, 1908	191
1,786 (59.5 KW.)	9 arc, 12 cbn., 102 Nernst	7=24 H.P.	..	101 KW.	32	Lg. 6; pb. lg. 3; pr. 3	Flat rate	30,000	*Resident engineer J. H. Dennison. Data for 1906-7 ..	192
10,000 (333 KW.)	18 arc, 24 cbn., 48 N.	108=490 H.P.	24=720 H.P.	1,366 KW.	6.8	Lg. 7 & 2, or 4½ to 4; pb. lg. 1.78; pr. 2 to 1; tr. 1.75	Max. dem., flat, sl. scale & cont. w. dis.	522,483	Lighting and traction. Data to June 30, 1907 ..	193
4,815 (160.5 KW.)	..	24=60 H.P.	..	210 KW.	27.8	Lg. 6; pr. 2½ to 1½	Flat rate	46,356	Part gas power	194
..	3 arc, 20 inc.	.. ..	..	207 KW.	..	Lg. 6; pb. lg. contract; pr. 3 ..	Flat rate	53,568	Part water power.	195
17,859 (595 KW.)	30 arc, 82 mtl., 202 N.	95=376 H.P.	..	948 KW. ..	4	Lg. 4½; pb. lg. arc £17, Nernst £5½ p.a.*; pr. 2 to 1	Flat rate & sliding scale	418,489	*£5 5s. all night; £3 3s. half-night. Data to Mar. 31, 1908	196
3,570 (119 KW.)	6 Nernst, 119 inc.	6=26 H.P.	..	151.5 KW.	..	Lg. 6; pb. lg. £226 p.a.; pr. 3 to 2½	Flat rate with discount	58,400	.. ..	197
19,961 (665 KW.)	..	41=919 H.P.	26=680 H.P.	2,319 KW.	10.3	Lg. 7 & 2½ (ave. max. 4½) w. discount; pr. 4½ & 1½	Max. demand w. dis., & 2-rate mr.	1,042,194	Lighting and traction. Data to Dec. 31, 1907	198
..	..	.. ..	..	230 KW.	..	Lg. 5; pr 2½	Flat rate	..	.. ..	199
4,000 (133 KW.)	..	.. ..	..	150 KW. ..	..	6d. with discounts	Flat rate	..	Part water power	200
8,200 (273 KW.)	10 mtl. ..	4=6 H.P. ..	..	278 KW. ..	14	Lg. 6; pb. lg. £1 p.a.; pr. 4 ..	Flat rate	44,000	Data to Dec. 31, 1907	201
17,503 (583 KW.)	50 arc ..	47=233 H.P.	28=730 H.P.	757 KW. ..	40	Lg. 4½ w. dis.; pb. lg. £880; pr. 2 w. dis.; tr. 1½	Sliding scale and flat rate	675,000	Lighting and traction. Data to May 15, 1908	202
21,045 (703 KW.)	10 arc, 362 cbn., 100 mtl., 36 N.	74=315½ H.P.	..	1,055 KW.	6.6	Lg. 4½ to 4¾; pb. lg. 1.83; pr. 3 to 1½; htg. 1½	Flat rate and max. demand*	540,000	Part gas power. *Pr. max. demand; flat rate in day-time. Data to Mar. 31, 1908	203
39,100 (1,304 KW.)	76 arc*, 200 cbn., 35 mtl.	53=219 H.P.	..	1,500 KW.	..	Lg. 5, or 7 & 3; pb. lg. arc £20, 32-C.P. inc. £3½ p.a.; pr. 1½.	Max. demand and flat rate	692,462	*Two 32-C.P. inc. used after midnight. Data to May 7, 1908	204
19,520 (651 KW.)	104 arc, 208 inc.	613½ H.P. ..	44=1,232 H.P.	2,183 KW.	11	Lg. 4½ to 3; pb. lg. arc £12 p.a.; pr. 1½ to ¾; tr. 1½	Sliding scale ..	1,178,223	Lighting and traction. Data to May 15, 1907	205
43,556 (1,452 KW.)	41 arc, 84 cbn.	101=434 H.P.	24=640 H.P.	2,294 KW.	15.7	Lg. 4½; pb. lg. 1½; pr. 2½ with dis.; tr. 1.7	Flat rate, sl. scale. & contract, w. dis.	761,872	Lighting and traction. Max. load recorded reduced, due to metallic-filament lamps. Data to Mar. 25, 1908	206
2,350 (78 KW.)	14 arc, 136 inc.	.. ..	..	100 KW. ..	..	Lg. 8 to 1½; pb. lg. 2½ inclusive	Flat rate, contract and special	..	.. ..	207
20,180 (673 KW.)	1 arc ..	36=66.7 H.P.	..	743 KW.	2	Lg. 7 & 2½, or 5½*; pr. 2½ or £5 p. H.P. p.a. & 1½ p.u.	Max. demand, flat rate & time switch*	230,253	*Time switch, 2½d. per unit for 20 hrs. and 6d. for 4 hrs. per day. Data for 1906-7	208
9,856 (328.5 KW.)	..	12=37 H.P.	..	337 KW.	18	Lg. 6½ to 5; pr. 3 to 2½, or £12½ per KW. p.a. & 2d. p.u.	Max. dem., flat, sl. scale, & 2 rate mtr.	101,770	Diesel oil engines. Data to Dec. 31, 1907	209
323,328 (10,788 KW.)	644 arc ..	1,479=8,879 H.P.	..	18,458 KW.	9.9	Lg. 4 & 1; pb. lg. 1½; pr. 1⅞ to 0.8 (less 5%)	Special scale* and max. demand	12,412,861	*Lg., 4d. first 1,000 hrs. use of lamps, 1d. after; pr. max. demand. Data to Mar. 31, 1908	210
5,800 (193 KW.)	..	20=75 H.P.	..	237 KW.	..	Lg. 7 & 3, or 6 to 3½; pr. 2 to 1½	Max. demand & flat rate; pr. sl. scale	96,698	Gas power.	211
152,152 (5,072 KW.)	..	188=704 H.P.	..	7,400 KW.	..	Lg. 4; pr. 2	Flat rate	2,015,000	.. ..	212
18,414 (614 KW.)	..	156=985 H.P.	..	1,399 KW.	..	Lg. 7 & 2, or 4½; pr. 3 & ⅞ (+10% March quarter)	Max. demand & flat rate	764,933	.. ..	213
71,275 (2,376 KW.)	297 arc ..	364=2,335 H.P.	72=2,160 H.P.	5,144 KW. (ex. tr.)	18.4	Lg. 3½; pb. lg. arc £16; pr. 1½; tr. 1	Flat rate with discount	2,521,759 (estimated)	Lighting & traction. *Also 66 radiators=77 KW. Data to April 30, 1908	214
9,596 (320 KW.)	..	14=50½ H.P.	..	370 KW. ..	16.8	Lg. 7 & 2½, or 5; pr. 4½ & 1½, or 2½	Max. demand & flat rate	115,793	Data to Dec. 31, 1907	215
58,825 (1,961 KW.)	79 arc, 1,278 cbn.	65=195 H.P.	120=3,600 H.P.	3,822 KW. (ex. tr.)	7	Lg. 5 & 2, or 4*; pr. 3 & 1, or 1½; tr. 1½	Max. demand & flat rate	3,801,7.2	Lighting and traction. *Pb. lg. arc £21, inc. £4.3.6 (two 40-C.P.) per annum. Data to Mar. 31, 1908	216
1,000 (33 KW.)	..	.. ..	..	33 KW. ..	..	10s. per 8-C.P.	Contract	..	Water power	217
..	60 arc ..	.. ..	..	400 KW. ..	..	Lg. 5; pr. 2	Flat rate	..	Gas power	218
37,494 (250 KW.)	34 arc, 24 cbn., 66 mtl., 7 N.	146=1,043 H.P.	16=420 H.P.	2,492.6 KW.	12.6	Lg. 5 & 2½, or 4½ (ch. 4); pr. 2 & 1, or 2½ to 2; tr. 1½	Max. dem., flat w. dis., sl. sc., 2-rate, t.s. & spl.	1,458,822	Data to May 27, 1908	219
617,640 (20,587 KW.)	193 arc, 342 inc.	2,129=8854 H.P.	764=19,100 H.P.	23,590 KW. (ex. tr.)	10.5	Lg. 3½, 3 & 2½; pb. lg. 2; pr. 2, 1½ & 1; tr. 1·050*	Sliding scale & flat rate	34,931,823	Lighting and traction. *Plus 4% for every 1s. paid for coal above 6s. per ton	220

=Nernst; A.=amperes; A.H.=ampere-hours; ph.=phase; A.C.=alternating current; D.C.=direct current.

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SUPPLY WORKS OF THE

LONDON.

	Place.	Supply Authority.	Year of opening.	Engineer.	Pressure of supply, volts.	Frequency and phase.	Total capacity of plant in KW.	Max. load recorded in KW.	Storage battery, max. discharge.	Total capital expended.	Private lighting, eqvt. 8 c.p. lamps.	Public lighting.	No. and H.P. of private motors
221	LLANDILO	Llandilo Urban District Council	1902	.. .. ..	230	Direct ..	120	39	23 KW.	£7,000	..	96 inc. ..	..
222	LLANDRINDOD WELLS	Llandrindod Wells Electric Light and Power Co., Ltd.	1897	J. Brown ..	230 & 460	Direct ..	260	..	..	..	..	..	..
223	LLANDUDNO	Llandudno Urban District Council	1898	H. Morton ..	220 & 440	Direct ..	700	460	36 KW.	£39,977	24,711 (824 KW.)	48 arc, 8 inc.	24=86 H.P...
224	LLANGOLLEN	Llangollen & District Electric Light and Power Co., Ltd.	1904	E. Bremner Smith	220	Direct ..	70	37	120 A.	£2,838	..	6 arc, 80×2 mtl.	2=8 H.P. ..
225	LLANRWST	Llanrwst Electricity Supply Co., Ltd.	1899	C. F. M'Innes ..	200	Direct ..	36	..	..	..	..	6 arc, 36 inc.	..
226	BATTERSEA	Battersea Corporation ..	1901	F. A. Bond ..	230 & 460	Direct ..	2,000	1,370	500 KW.	£220,000	50,418 (1680.5 KW.)	381 arc, 205 Nernst	620 H.P. ..
227	BERMONDSEY	Bermondsey Corporation ..	1902	W. E. J. Heenan	240 & 480	Direct ..	975	682	70 KW.	£117,000	23,474 (782.5 KW.)	168 arc, 608 inc., 3 Nernst	1,403 H.P. ..
228	CHELSEA	Chelsea Electricity Supply Co., Ltd.	1889	Percy Still ..	200 & 400	Direct ..	3,500	2,627	..	£491,273	..	..	..
229	CITY OF LONDON	City of London Electric Lighting Co., Ltd.	1891	F. Bailey ..	204 & 410 D.C., 204 A.C.	Direct & 100~, 1-ph.	24,000	18,000	..	£2,091,671	..	..	..
230	FINSBURY	County of London Electric Supply Co., Ltd.	1897	C. P. Sparks ..	104 A.C., 530 D.C.	50~, 2-ph. & direct	5,550	4,180	595 KW.	£1,553,786*	475,327* (15,844 KW.)	..	9,517* H.P...
231	FULHAM	Fulham Borough Council ..	1901	Arthur J. Fuller	200	50~, 3-ph.	2,950	1,613	..	£2,261,240	87,857	274 arc, 404 ..	154=1,056 H.P.
232	GREENWICH, LEWISHAM DEPTFORD, PENGE & SYDENHAM*	South Metropolitan Electric Light & Power Co., Ltd.	1900	H. W. Bowden (Man. Dir.)	200	50~, 3-ph.	6,000	2,550	..	£514,929	..	inc., 214 Nernst	..
233	HACKNEY	Hackney Borough Council* ..	1901	L. L. Robinson	240 & 480	Direct ..	4,800	2,218	300 KW. for 4 hrs.	£305,000	99,957 (2,998 KW.)	498 arc, 49 N.	445=2,121 H.P.
234	HAMMERSMITH	Hammersmith Corporation ..	1897	G. G. Bell ..	110 & 220	50~, 1-ph.	5,000	3,710	..	£375,444	87,502 (2,917 KW.)	264 arc, 65 inc.	260=1,727 H.P.
235	HAMPSTEAD	Hampstead Corporation ..	1894	G. H. Cottam ..	105 & 210	90~, 1-ph.	4,990	3,457	..	£390,930	289,872 (9,662 KW.)	122 arc ..	79=481 H.P.
236	ISLINGTON	Islington Borough Council ..	1896	Albert Gay ..	100, 200 & 400	50~, 1-ph.	5,100	3,485	30 KW. for 3 hrs.	£453,710	130 690 (4,356 KW.)	610 arc ..	334=1,680 H.P.
237	KENSINGTON	Brompton and Kensington Electricity Supply Co., Ltd.	1889	Henry W. Bowden	100	83~, 1-ph.	2,575	2,100	..	£269,584	..	16 arc ..	55=265 H.P.
238	KENSINGTON (N. OF HIGH STREET)	Notting Hill Electric Lighting Co., Ltd.	1891	Geo. Schultz ..	200	Direct ..	3,000*	1,480	260 KW.	£233,526	154,739 (5,158 KW.)	52 arc ..	57=211 KW.
239	KENSINGTON AND KNIGHTSBRIDGE	Kensington & Knightsbridge Electric Lighting Co., Ltd.	1887	H. W. Miller ..	200	Direct ..	5,000*	4,300	800 KW.	£367,680	..	44 arc ..	161=600 H.P.
240	KENSINGTON AND NOTTING HILL	Jt. Ctee. of K. & Knightsbridge & Notting Hill E. L. Cos.	1900	H. W. Miller and G. Schultz	5,250	45~, 3-ph.	6,000	3,400	15 KW.	£184,049	..	..	..
241	LAMBETH	South London Electric Supply Co., Ltd.	1899	H. W. Sprunt ..	220	50~, 1-ph.	3,800	2,000	..	..	124,880 (4,162 KW.)	25 arc ..	310=1,675 H.P.
242	LONDON* & WESTMINSTER	London Electric Supply Corporation Ltd.	1895	G. W. Partridge	100 & 200 A.C. 230&460 D.C.	85~, 1-ph., & direct†	15,000	7,240	..	£1,155,221	251,515 (8,384 KW.)	..	2,750 H.P. ..
243	MARYLEBONE	Marylebone Corporation ..	1887	F. A. Wilkinson	240 & 480	Direct ..	12,000	7,406	4,950 KW.	..	444,956 (14,831 KW.)	87 flame arc	450=1,230 H.P.
244	MID LONDON AND PADDINGTON	Metropolitan Electric Supply Co., Ltd.	1887	J. S. Highfield..	100 & 200	60~, 1-ph. & 2-ph.	18,500	9,861 (inc. bulk)	2,400 KW.	£1,840,877	..	..	2,548 H.P.
245	POPLAR	Poplar Corporation	1900	J. H. Bowden ..	230 & 460	Direct ..	3,400	1,224	180 KW.	£187,000	..	320 arc, 526 inc.	190=1,703 H.P.
246	ST. JAMES' WESTMINSTER	St. James & Pall Mall Electric Light Co., Ltd.	1889	S. T. Dobson ..	107 & 214	Direct ..	7,880	5,784	180 A.	£426,574	234,147 (9,093 KW.)	66 arc ..	1,833 KW. (inc. htg.)
247	ST. PANCRAS	St. Pancras Corporation ..	1891	S. W. Baynes ..	110, 220 & 440	Direct* ..	6,390	3,193	..	£460,368	..	461 arc ..	315 H.P. ..
248	SHOREDITCH	Shoreditch Corporation ..	1897	C. N. Russell ..	150	Direct ..	1,455	1,460	60 KW. for 6 hrs.	£196,912	..	260 arc ..	..
249	SMITHFIELD	Smithfield Markets Electric Supply Co., Ltd.	1897	E. Dowling ..	100 & 200	Direct ..	965	657	..	£121,738	33,060 (1,101 KW.)	618 cbn. ..	517 H.P. ..
250	SOUTHWARK	Southwark Corporation ..	1899	D. M. Kinghorn	220 & 440	Direct ..	1,212	730	92 KW.	£88,499	33,660 (1,122 KW.)	99 arc, 4 cbn., 162 Nernst	67=419 H.P.
251	STEPNEY	Stepney Borough Council ..	1899	W. C. P. Tapper	240 & 480	Direct ..	3,720	2,831	96 KW.	£287,961	124,423 (3,732 KW.)	418 arc, 2 cbn., 6 mtl., 142 N.	515=3,531 H.P.
252	STOKE NEWINGTON	Stoke Newington Corporation	1902	S. Hann.. ..	240 & 480	Direct ..	240*	225	55 KW.	£26,459	8,490 (283 KW.)	9 arc ..	21=60 KW.
253	WANDSWORTH	County of London Electric Supply Co., Ltd.	1897	C. P. Sparks ..	205	50~, 2-ph.	5,450	3,970	..	£1,533,786*	475,327* (15,844 KW.)	..	317 KW.
254	WESTMINSTER	Westminster Electric Supply Corporation, Ltd.	1891	Sir A. B. W. Kennedy	200 & 400	Direct ..	16,113*	10,239	..	£1,115,915	..	961 arc, 203 inc.	..
255	WESTMINSTER & ST. JAMES	Central Electric Supply Co., Ltd.	1902	Sir A.B.W.Ken'dy S. T. Dobson*	6,000	50~, 3-ph.	8,580	6,329	450 A.H. (stn. htg.)	£507,986	..	..	40=10,000 KW. (motor-gen.)
256	WESTMINSTER, HOLBORN & CITY OF L.	Charing Cross, West End & City Electricity Supply Co.	1891	H. W. Kingston	100, 200 & 400	Direct ..	20,400	12,243	3,075 KW. (normal)	£2,302,423	715,996 (21,480 KW.)	166 arc ..	11,109 H.P...
257	WOOLWICH, PLUMSTEAD & ELTHAM	Woolwich Corporation ..	1893	.. .. ..	210 & 420*	Direct* ..	1,728	737	..	£163,965	41,154 (1,372 KW.)	77 arc, 154 inc., 18 Nernst	320 H.P.
258	LONDONDERRY	Londonderry Corporation ..	1894	R. V. Macrory ..	220 & 440	Direct ..	700	423	500 A.H.	£53,516	11,278 (376 KW.)	185 arc, 94 cbn. 3 mtl.	52=319 H.P.
259	LONG EATON	Harrington Electric Light Co., Ltd.	1897	W. B. Smith ..	115	Direct ..	210	120	..	£5,430	4,090 (133 KW.)	..	..
260	LONG EATON	Long Eaton Urban District Council	1903	F. Worrall ..	220	Direct ..	450	242	..	£22,864	13,880 (463 KW.)	2 arc, 290 inc., 92 Nernst	57=140 H.P.
261	LONGTON	Longton Corporation.. ..	1901	W. Langford ..	230	Direct ..	300	131	48 KW.	£24,191	9,722 (324 KW.)	..	58=151 H.P.
262	LOUGHBOROUGH	Loughborough Corporation ..	1904	W. H. Allen ..	220 & 440	Direct ..	500	337	166 KW.	£30,800	10,244 (341 KW.)	12 arc, 38 mtl.	48=222 H.P.
263	LOWESTOFT	Lowestoft Corporation ..	1901	G. A. Bruce ..	230 & 460	Direct ..	1,475	763	..	£73,941	31,184 (1,039 KW.)	80 arc, 340 inc.	54=320 H.P.
264	LUDLOW	Ludlow Electric Light Co., Ltd.	1907	Edwards and Armstrong	230	Direct ..	75	17	10 KW.	£3,600	..	2 mtl.	4=2½ H.P.
265	LUTON	Luton Corporation	1901	W. H. Cooke ..	250 & 500	Direct ..	647	353	120 KW.	£36,679	18,700 (623 KW.)	10 arc, 24 inc., 3 Nernst	114=545 H.P.
266	LYMINGTON	Lymington Electric Light & Power Co., Ltd.	1900	Glynn Salter ..	240	Direct ..	150	90.2	55 KW.	£36,211	13,095 (436.5 KW.)	112 N.	24=78 H.P.
267	LYNTON & LYNMOUTH	Lynton & Lynmouth Electric Light Co., Ltd.	1890	P. T. Kimmins	100	100~, 1-ph.	175	89.5	..	£8,000	4,805 (160 KW.)	90 cbn., 12 mtl.	4=15 H.P. ..
268	MACROOM	Macroom & District Electric Lighting Syndicate	1899	D. E. McDonnell	230	100~, 1-ph.	150	47	..	..	2,005 (67 KW.)	87 inc. ..	..
269	MAIDENHEAD	Maidenhead Corporation ..	1902	C. O. Milton ..	230 & 460	Direct ..	406	275	100 KW.	£42,000	20,300 (677 KW.)	55 arc, 104 N., 50 mtl.	33=125 H.P.
270	MAIDSTONE	Maidstone Corporation ..	1901	E. E. Hoadley ..	230 & 460, tr. 500	Direct ..	1,250	797	138 KW..	£66,000	25,988 (866 KW.)	7d arc., 96 cbn., 44 mtl., 300 N.	996 H.P. ..
271	MALVERN	Malvern Urban Dist. Council	1904	W. J. R. Baker..	100 & 200	50~, 1-ph.	200	100	..	£17,000	11,230 (374 KW.)	..	12=35 H.P.
272	MANCHESTER	Manchester Corporation ..	1893	S. L. Pearce	100, 200, & 400 D.C.*	Direct, and 50~, 3-ph.*	33,800	25,180	480 KW.	£2,338,373	628,133 (20,938 KW.)	41 arc ..	2,805=17,462 H.P.
273	MANSFIELD	Mansfield Corporation ..	1903	E. Holcombe Hewlett	240 & 480	Direct ..	720	330 lg. 500 tr.	280 KW. (1 hour)	£70,653*	15,699 (523 KW.)	40 arc, 12 Nernst	69=919 H.P.
274	MARDY (CLAM.)	Mardy Electric Light Co., Ltd.	1898	W. W. Ross ..	220*	Direct ..	60	49	12 KW.	£3,000	4,000 (133 KW.)	2 arc, 60 mtl.	5=10 H.P.
275	MARGATE & BROADSTAIRS & S. PETERS	Isle of Thanet Electric Tramways & Lighting Co., Ltd.	1903	J. A. Forde ..	210 & 430, tr. 500-550	Direct ..	1,100	950	60 KW.	..	270 KW.	22 arc ..	7=35 KW.
276	MARKET DRAYTON	Market Drayton Electric Light & Power Co., Ltd.	1903	C. F. Bottomley	240 & 480	Direct ..	90	66.5	43.2 KW.	£15,862	6,551 (218 KW.)	..	19=84 H.P.
277	MELROSE	Electric Supply Corporation, Ltd.	1904	K. A. Scott-Moncrieff*	225 & 450	Direct ..	66	19.8	35 KW.	£10,000	1,761 (58.7 KW.)	2 cbn., 44 Nernst	16 H.P.
278	MELTON MOWBRAY	Melton Mewbray Electric Light Co., Ltd.	1900	J. E. Edmundson	240 & 480	Direct ..	300	173	86 KW.	£39,993	11,779 (390 KW.)	8 arc, 158 cbn., 14 Nernst	44=129½ H.P.
279	MERTHYR TYDFIL	Merthyr Electric Traction and Lighting Co., Ltd.	1901	L. W. Dixon ..	230 & 460	Direct ..	820	lg. 371, tr. 297	380 A.H.	£47,028	15,4.7 (514 KW.)	14 arc ..	100½ H.P.
280	MEVAGISSEY	Mevagissey Electric Supply Co., Ltd.	1896	R. F. Browne ..	110	Direct ..	40	..	..	£1,600	..	38 inc. ..	..
281	MEXBOROUGH	Mexborough Urban District Council	1902	John Senior ..	220 & 440	Direct ..	300	202	50 KW.	£20,340	9,840 (328 KW.)	15 arc, 254 cbn.	19=59 H.P.
282	MIDDLESBROUGH	Middlesbrough Corporation ..	1901	Horace M. Taylor	220 & 440	Direct ..	1,600	1,225	176 KW.	£105,000	59,958 (1,998.6 KW.)	..	145=1,063 H.P.
		Middleton Corporation ..	1902	S. Pauls	220 & 440	Direct ..	768	640	100 A.	£39,000	6,715 (235 KW.)	18 arc, 36 cbn.	48=250 H.P.

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HE UNITED KINGDOM.

Public lighting.	No. and H.P. of private motors	No. and H.P. of traction motors.	Total connections of all kinds.	Percentage increase during year.	Price charged per unit, pence.	System of charging.	Units sold during last complete year.	Remarks.	
nc. ..	..	..	..	..	Lg. 6; pb. lg. 3; pr. 3	Flat rate	..	.. ..	221
..	..	..	..	..	Lg. 6; pr. 6 to 3½	Flat rate & scale ..	120,000	.. ..	222
rc, 8 inc.	24=86 H.P...	..	1,000 KW.	..	Lg. 7 & 2½, or 5½; pb. lg. 1.5; pr. 2	Max. demand, flat rate & contract	484,000	Max. load in summer	223
rc, 80×2 mtl.	2=8 H.P. ..	..	..	..	Lg. 7 & 4; pb. lg. 3, & cont.; pr. 4 (min. 10s. per H.P. per qr.)	Max. demand & flat rate	27,364	.. ..	224
c, 36 inc.	..	..	53 KW.	..	Lg. 7; pr. 4½	Flat rate	..	.. ..	225
arc, 205 ernst	620 H.P. ..	..	2,430 KW.	..	Lg. 3½; pb. lg. arc £18 p.a; pr. 1	Flat rate	2,160,000	.. ..	226
arc, 608 3 Nernst	1,408 H.P. ..	..	2,100 KW.	..	Lg. 6 & 2; pb. lg. 1½; pr. 1½ & ¾	Max. demand ..	1,564,000	.. ..	227
..	..	..	8,025 KW.	..	Lg. 5½ & under; pr. 1½	Flat rate	3,548,623	.. ..	228
..	..	..	33,681 KW.	12	Average obtained, lg. & pr. 2.63	Flat rate, sliding scale, etc.	23,684,575	.. ..	229
..	9,517* H.P...	..	25,361 KW.*	..	Lg. 5 (bus.), 5½ (pr. ho.), 3 (bsmnt.); pr. 2½ to 1½; htg. 1½	Flat rate, sl. scale & contract	10,755,424*	Data to Dec. 31, 1906. *Jointly with Wandsworth.	230
arc, 404	154=1,056 H.P.	..	4,018 KW.	..	Lg. 3½; pb. lg. 1; pr. 1 ..	Flat rate	2,840,623	Date to Mar. 31, 1908	231
14 Nernst	..	..	5,510 KW.	11	Lg. 6 w. dis.; pr. £4+0.75 d.p.u., and special by agreement	Flat rate, max. dem. and 2-rate meter	2,946,607	*Also Blackheath, Catford, C. Palace, &c., and parts of Lambeth & Camberwell. Data to Dec. 31, 1907 ..	232
arc, 49 N.	445=2,121 H.P.	..	4,821 KW.	23.73	Lg. 3½, or 6 & 1; pb. lg. arc £18, £12, £11, N. £4 p.a.; pr. 1½*	Max. demand and flat rate*	3,852,000 (estimated)	*Also £1 per KW. per qr. & ½d. p.u.; churches 3d. p.u. Data to Mar., 1908	233
rc, 65 inc.	260=1,727 H.P.	..	4,259 KW.	..	Lg. 3; pb. lg. arc £20 and 27½ p.a.; pr. 1½ to 1	Flat rate	4,223,008	.. ..	234
arc ..	79=481 H.P.	..	10,100 KW.	..	Lg. 6 & 1½, or 4*; pb. lg. arc £26½ p.a.; pr. 1 & 1½; htg. 1½	Max. demand and flat rate	4,303,765	* Arc lighting 3½d. & 1½d.	235
arc ..	334=1,680 H.P.	..	6,344 KW.	16.82	Lg. 3½; pb. lg. £15,734 p.a.; pr. 1	Flat rate, sliding scale & contract	4,789,694	Data to Mar. 31, 1908 (approx.)	236
rc ..	55=265 H.P.	..	2,496 KW.	5.5	Lg. 5½ to 4 (shops 3½; pb. lg. 1; pr. 1	Flat rate with discounts	2,993,538	Data to Dec. 31, 1907	237
rc ..	57=211 KW.	..	5,395 KW.	5	Lg. 5 w. dis. to 20%; pb. lg. 1; pr. 2 to ½	Sliding scale or flat rate	1,913,555	*Inc. steam plant, battery & motor-generators. Bulk supply from Wood Lane Works. Data to Dec. 31, 1907	238
rc ..	161=600 H.P.	..	11,500 KW.	8.5	Lg. 5 & 3; pb. lg. 1; pr. 3 to ½, or 1	Flat rate & scales with discounts	5,838,288	*Motor-generators., 3,580 KW.; 1,760 KW. received from Wood Lane Works. Data to Dec. 31, 1907	239
..	..	..	..	..	.. ..	..	7,668,477	Bulk sup. to companies named; motor-genrs., 4,280 KW. Resident engineer, C. M. Bennett. Data to Dec. 31, '07	240
rc ..	310=1,675 H.P.	..	5,408 KW.	12.2	Lg. 7 & 2, or 4½; pr. spl. rates..	Max. dem., flat rate & contract	2,661,454	Data to Dec. 31, 1907	241
..	2,750 H.P. ..	..	10,675 KW.	8	Lg. 5½ to 3½, or 6 & 3; pr. 2½ to ¾	Sliding scale or max. demand	10,011,987	*Berm'sey, Ch'sea, D'ford, Gr'wich, So'wark, parts C'well, Fins'y & L'beth. †Also 25~, 3-ph. Data to Dec. 31, '07	242
ame arc	450=1,230 H.P.	..	17,125 KW.	8.44	Lg. 8 & 1 (flat rate 2 for day load, etc.); pr. 2 & 1	Max. demand and flat rate	8,797,111	Data to Mar. 31, 1908	243
..	2,548 H.P.	..	18,800 KW.*	7.26	Lg. 5 to 5½; pr. 3 & ¾	Max. demand, flat rate, & 2-rate mtr.	11,049,255	*Excluding bulk supply to Acton. Data to Dec. 31, 1907	244
arc, 525 c.	130=1,703 H.P.	..	4,667 KW.	..	Lg. 5 & 3; pb. lg. 1½; pr. 1½ ..	Max. demand and flat rate	3,041,000	.. ..	245
rc ..	1,833 KW. (inc. htg.)	..	10,926 KW.	10.50	Lg. 5½ & 4 (basements 3 & 2); pb. lg. arc £17 p.a.; pr. 1	Flat rate & sliding scale	9,026,915	Motor-generators, 2,340 KW.; bulk supply from Central Electric Supply Co., Ltd. Data to Dec. 31, 1907	246
arc ..	315 H.P. ..	..	10,467 KW.	..	Lg. 6 & 1½, or 4; pb. lg. 3; pr. 1	Max. demand and flat rate	6,056,000	*3-phase A.C., 5,000 V., 50 ~ to sub-stations	247
arc ..	.. ..	..	6,667 KW.	..	Lg. 5 & 2, or 4½; pr. 2	Max. demand and flat rate	3,700,000	High pressure D.C. with transformers 1,100 V. to 150 V.	248
cbn. ..	517 H.P. ..	..	1,550 KW.	3.5	Lg. 6 to 3½*; pr. 2½ to 1 ..	Sliding scale ..	1,916,535	*Including wiring, maintenance, & lamp renewals. Data to Dec. 31, 1907	249
c, 4 cbn., Nernst	67=419 H.P.	..	1,556.5 KW.	14	Lg. 6 & 1, or 4½; pb. lg. 1½; pr. 3 & 3½, or 2½; htg. 1	Max. demand, flat rate & special	1,197,364	Data for 1906-7	250
rc, 2 cbn., 1., 142 N.	515=3,531 H.P.	..	7,367 KW.	31.3	Lg. 8 & 1, or 6 & 0.9; pb. lg. 6 & 0.9; pr. 1*	Max. demand and flat rate	5,712,684	*Or 5s. per H.P. per month, & ½d. per unit. Data to Mar. 31, 1908	251
..	21=60 KW.	..	351 KW.	4	Lg. 7 & 2, or 5; pr. 5 & 1, 4 & 1, or 3, 2	Max. dem., flat rate, 2-rate mr. & cont.	214,683	*Bulk supply at 10,000 V. from North Met. Electric Power Supply Co. Data to Mar. 31, 1908	252
..	317 KW.	..	25,361 KW.*	..	Lg. 5 (bus.), 5½ (pr. ho.), 3 (bsmnt.); pr. 2½ to 1½; htg. 1½	Flat rate, sl. scale & contract	10,755,424*	Data to Dec. 31, 1906. *Jointly with Finsbury	253
arc, 203 inc.	..	..	30,986 KW.	10.8	Lg. 5½, 4½ & 3½; pb. lg. arc £22 less 3%; pr. 1	Sliding scale and flat rate	17,107,904	*Of this 8,230 KW. in motor-generators.; bulk supply from Central Elec. Supply Co. Data to Dec. 31, 1907	254
..	40=10,000 KW. (motor-gen.)	..	..	..	Bulk supply	Flat rate	17,431,370	*Resident engineer, H. P. Gaze. Supply to Westminster & St. James Cos. Data to Dec. 31, 1907	255
arc ..	11,109 H.P...	..	29,812 KW.	7.6	Lg. 6 to 3; pr. 3 to ¾	Flat rate, sliding scale & contract	18,941,474	Data to Dec. 31, 1907	256
, 154 inc., Nernst	320 H.P.	..	1,703.5 KW.	..	Lg. 7 & 2½, or 4; pr. 2 to 1½ ..	Max. demand, flat rate & scale	1,000,000	*200 V., A.C., 50~ 1-ph., for Eltham only..	257
rc, 94 cbn. mtl.	52=319 H.P.	..	791 KW. ..	8.5	Lg. 6 & 1½, or 4½*; pr. 6 to 1½; htg. 1	Max. dem., flat rate & sliding scale	632,253	*Pb. lg. arc £18.9, inc. (32 c.p.) £3.2 p.a. Data to Jan. and Mar. 31, 1908	258
..	.. ..	..	161 KW. ..	..	Lg. 3½	Flat rate	..	.. ..	259
, 290 inc., Nernst	57=140 H.P.	..	628 KW.	..	Lg. 3½ to 2; pb. lg. 2; pr. 2½ to ¾	Flat rate & scale ..	..	.. ..	260
..	58=151 H.P.	..	437 KW. ..	16	Lg. 8 & 2, or 6; pr. 2½ to 1¼ (all less 5%)	Max. demand, flat rate & sl. scl. w. dis.	188,573	Data to Mar. 31, 1908	261
rc, 38 mtl.	48=222 H.P.	..	617 KW. ..	8.4*	Lg. 4 (factories 3); pb. lg. 2½; pr. 1	Flat rate	258,646	*Largest consumer (173 KW.) has installed private plant, also mtl. fil. lamps increasing. Data to Mar. 31, 1908	262
, 340 inc.	54=320 H.P.	40=1,000 H.P.	2,108 KW.	..	Lg. 4½; pb. lg. 3; pr. 2 & 1½; tr. 2½ & 2	Flat rate	936,869	Lighting & traction. Data to Sept. 31, 1907	263
mtl.	4=24 H.P.	..	28 KW.	*	Lg. 7 with discounts; pb. lg. 4; pr. 4	Flat rate with discounts	9,553	Data to Dec. 31, 1907	264
c, 24 inc., Nernst	114=545 H.P.	..	1,142.5 KW.	..	Lg. 6 & 2, or 4; pb. lg. 2; pr. 2, 1½ & 1	Max. demand, flat rate & sl. scale	..	.. ..	265
12 N.	24=78 H.P.	..	559.6 KW.	11	Lg. 7 & 4, or 2½; pb.lg. £2½ & £2½ p.a.; pr. 4 & 1½, or 2½	Max. demand & flat rate	109,620	Data to Dec. 31, 1907	266
a., 12 mtl.	4=15 H.P. ..	..	187 KW. ..	..	Lg. 5; pb. lg. inc. £2½ p.a.; pr. 2½	Flat rate & contract	131,790	Part water power. Data to Mar. 25, 1908	267
nc. ..	.. ..	..	77.5 KW.	..	Lg. 4½, or 1s. per c.p. p.a.; pb. lg. contract	Flat rate and contract	..	Part water power	268
c, 104 N., 9 mtl.	33=125 H.P.	..	767 KW.	..	Lg. 5; pb. lg. arc £18½ to £10, inc. £3 p.a.; pr. 2 to 1½	Flat rate and max. demand	..	.. ..	269
., 86 cbn., il., 300 N.	996 H.P. ..	40=1,000 H.P.	1,667 KW.	18	Lg. 7 & 2, or 4; pb. lg. 1 4; pr. 2 to 1 (t.sw. 1); tr. 1.5	Max.dem.& flat rate; pr. sl. sc. & t. sw.	1,206,973	Lighting and traction. Data to Mar. 31, 1908	270
..	12=35 H.P.	..	400 KW. ..	71.5	Lg. 6 first 2½ units per 8-C.P. per qr., all above, 4; pr. 3	Special scale and flat rate	85,000	Data to Mar. 31, 1908	271
..	2,805=17,462 H.P.	See other table	34,507 KW. (ex. tr.)	..	Lg. 4½ & 1¾; pb. lg. 2; pr. 1¾ to 1; tr. 1½ approx.	Max. demand and sliding scale	47,564,908	Lighting and traction, three stations. *A.C. 6,500 volts.	272
are, 12 rnst	62=912 H.P.	40=1,040 H.P.	2117.5 KW.	12.5	Lg. 7 & 1; pr. 4 & 1 (day 1); tr. 1½ to 1	Max. demand and 2-rate meters	1,021,785	Lighting and traction. *Including cost of destructor, £13,400. Data to Mar. 31, 1908	273
, 60 mtl.	5=10 H.P.	..	163 KW.	..	Lg. 4½; pb. lg. arc £12½, mtl. £3½ p.a.	Flat rate	60,000	Overhead mains. *Private lg. 230 volts 2-wire; public lg. 110 volts 3-wire	274
c ..	7=35 KW.	120=3,000 H.P.	700 KW. (ex. tr.)	..	Lg. 5 with discount; pb. lg. 2½; pr. 3 with di-count	Flat rate with discounts	1,500,000	Lighting and traction station. Data to Sept. 30, 1907	275
..	19=84 H.P.	..	292 KW. ..	..	Lg. 7 & 4; pr. 2½	Max. demand & flat rate	52,631	.. ..	276
on., 44 rnst	16 H.P.	..	80.5 KW.	..	Lg. 6; pb. lg. 3; pr. 3	Flat rate	19,400	*Resident engineer J. G. Campbell. Gas power. Data for 1906-7	277
158 cbn., Nernst	44=129½ H.P.	..	579 KW. ..	7	Lg. 5½; pb. lg. £325 p.a.; pr. 4, & 1½, or 2½	Lg. flat & contract; pr. m.d. & flat	223,062	Data to Dec. 31, 1907	278
c ..	100½ H.P.	30=990 H.P.	1,604 KW.	..	Lg. 7 & 3*; pb. lg. £16.8 p.a.; pr. 4½ & 1½; tr. 1½	Max. demand* and flat rate	642,735	Lighting and traction. *Max. average, 3¾d. Data to Dec. 31, 1907	279
c. ..	.. ..	..	..	30	Lg. 6; pb. g. contract.. ..	Flat rate and contract	..	Under reconstruction	280
, 254 cbn.	19=59 H.P.	..	418 KW.	3·4	Lg. 3, 3½, 4; pb. lg. 2.08; pr. 1½, 2, 2½	Flat rates	295,099	Data to Mar. 31, 1908	281
..	145=1,064 H.P.	..	2,875 KW.	..	Lg. 6 & 2, or 4; pr. 2 & 1	Max. demand & flat rate	1,489,000	Motors on hire-purchase system	
c, 36 cbn.	48=250 H.P.	See other Table	360·5 KW. (ex. tr.)	..	Lg. 4 to 3; pb. lg. 3; pr. 2 to	Flat rate and	..	Lighting and traction. Local Traction Co.	

[illegible]	WESTMINSTER & ST. JAMES	Central [illegible] Supply Co., Ltd.	[illegible]	[illegible] S. T. Dobson*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	450 A.C. (stn. ltg.)	£607,966	..	..	40=10,000 kW (motor-gen.)
256	WESTMINSTER, HOLBORN & CITY OF L.	Charing Cross, West End & City Electricity Supply Co.	1891	H. W. Kingston	100, 200 & 400	Direct ..	20,400	12,243	3,075 kW. (normal)	£2,302,423	715,996 (21,480 kW.)	166 arc ..	11,109 H.P.
257	WOOLWICH, PLUMSTEAD & ELTHAM	Woolwich Corporation ..	1898	.. .. ..	210 & 420*	Direct* ..	1,728	737	..	£163,965	41,154 (1,372 kW.)	77 arc, 154 inc., 18 Nernst	320 H.P.
258	LONDONDERRY	Londonderry Corporation ..	1894	R. V. Macrory ..	220 & 440	Direct ..	700	423	500 A.H.	£53,516	11,278 (376 kW.)	185 arc, 94 cbn. 3 mtl.	52=319 H.P.
259	LONG EATON	Harrington Electric Light Co., Ltd.	1897	W. R. Smith ..	115	Direct ..	210	120	..	£5,430	4,000 (133 kW.)	..	..
260	LONG EATON	Long Eaton Urban District Council	1903	F. Worrall ..	220	Direct ..	450	242	..	£22,864	13,880 (463 kW.)	2 arc, 390 inc., 92 Nernst	57=140 H.P.
261	LONGTON	Longton Corporation	1901	W. Langford ..	230	Direct ..	300	131	48 kW.	£24,191	9,722 (324 kW.)	..	58=151 H.P.
262	LOUGHBOROUGH ..	Loughborough Corporation ..	1904	W. H. Allen ..	220 & 440	Direct ..	500	337	166 kW.	£30,800	10,244 (341 kW.)	12 arc, 38 mtl.	48=292 H.P.
263	LOWESTOFT	Lowestoft Corporation ..	1901	G. A. Bruce ..	230 & 460	Direct ..	1,475	763	..	£73,941	31,182 (1,039 kW.)	80 arc, 340 inc.	54=320 H.P.
264	LUDLOW	Ludlow Electric Light Co., Ltd.	1907	Edwards and Armstrong	230	Direct ..	75	17	10 kW.	£3,600	..	2 mtl.	4=2½ H.P.
265	LUTON	Luton Corporation	1901	W. H. Cooke ..	250 & 500	Direct ..	647	353	120 kW.	£36,679	18,700 (623 kW.)	10 arc, 24 inc., 3 Nernst	114=545 H.P.
266	LYMINGTON	Lymington Electric Light & Power Co., Ltd.	1900	Glynn Salter ..	240	Direct ..	150	90.2	55 kW.	£36,211	13,095 (436.5 kW.)	112 N.	24=78 H.P.
267	LYNTON & LYNMOUTH	Lynton & Lynmouth Electric Light Co., Ltd.	1890	P. T. Kimmins	100	100~, 1-ph.	175	89.5	..	£8,000	4,805 (160 kW.)	90 cbn., 12 mtl.	4=15 H.P.
268	MACROOM	Macroom & District Electric Lighting Syndicate	1899	D. E. McDonnell	230	100~, 1-ph.	150	47	..	..	2,005 (67 kW.)	87 inc. ..	..
269	MAIDENHEAD	Maidenhead Corporation ..	1902	C. O. Milton ..	230 & 460	Direct ..	406	275	100 kW.	£42,000	20,300 (677 kW.)	55 arc, 104 N., 50 mtl.	33=125 H.P.
270	MAIDSTONE	Maidstone Corporation ..	1901	E. E. Hoadley ..	230 & 460, tr. 500	Direct ..	1,250	797	138 kW..	£66,000	25,988 (868 kW.)	72 arc., 36 cbn., 44 mtl., 300 N.	996 H.P.
271	MALVERN	Malvern Urban Dist. Council	1904	W. J. R. Baker..	100 & 200	50~, 1-ph.	200	100	..	£17,000	11,220 (374 kW.)	..	12=35 H.P.
272	MANCHESTER	Manchester Corporation ..	1893	S. L. Pearce	100, 200, & 400 D.C.*	Direct, and 50~, 3-ph.*	33,800	25,180	480 kW.	£2,338,373	628,133 (20,938 kW.)	41 arc ..	2,805=17,462 H.P.
273	MANSFIELD	Mansfield Corporation ..	1903	E. Holcombe Hewlett	240 & 480 tr. 550-600	Direct ..	720	330 lg. 500 tr.	280 kW. (1 hour)	£70,658*	15,692 (523 kW.)	40 arc, 19 Nernst	69=319 H.P.
274	MARDY (CLAM.) ..	Mardy Electric Light Co., Ltd.	1898	W. W. Ross ..	220*	Direct ..	60	49	12 kW.	£3,000	4,000 (133 kW.)	2 arc, 60 mtl.	5=10 H.P.
275	MARGATE & BROADSTAIRS & S. PETERS	Isle of Thanet Electric Tramways & Lighting Co., Ltd.	1903	J. A. Forde ..	240 & 480, tr. 500-550	Direct ..	1,100	950	60 kW.	..	270 kW.	22 arc ..	7=35 kW.
276	MARKET DRAYTON ..	Market Drayton Electric Light & Power Co., Ltd.	1903	C. F. Bottomley	240 & 480	Direct ..	90	66.5	43.2 kW.	£15,862	6,551 (218 kW.)	..	19=84 H.P.
277	MELROSE	Electric Supply Corporation, Ltd.	1904	K. A. Scott-Moncrieff*	225 & 450	Direct ..	66	19.8	35 kW.	£10,000	1,761 (58.7 kW.)	2 cbn., 44 Nernst	16 H.P.
278	MELTON MOWBRAY ..	Melton Mowbray Electric Light Co., Ltd.	1900	J. E. Edmundson	240 & 480	Direct ..	300	173	86 kW.	£39,993	11,779 (390 kW.)	8 arc, 158 cbn., 14 Nernst	44=129½ H.P.
279	MERTHYR TYDFIL ..	Merthyr Electric Traction and Lighting Co., Ltd.	1901	L. W. Dixon ..	230 & 460	Direct ..	820	lg. 271, tr. 297	380 A.H.	£47,028	15,457 (514 kW.)	14 arc ..	100½ H.P.
280	MEVACISSEY	Mevagissey Electric Supply Co., Ltd.	1896	R. F. Browne ..	110	Direct ..	40	..	..	£1,600	..	38 inc. ..	..
281	MEXBOROUGH	Mexborough Urban District Council	1902	John Senior ..	220 & 440	Direct ..	300	202	50 kW.	£20,240	9,840 (328 kW.)	15 arc, 254 cbn.	19=59 H.P.
282	MIDDLESBROUGH ..	Middlesbrough Corporation ..	1901	Horace M. Taylor	220 & 440	Direct ..	1,600	1,225	176 kW.	£105,000	59,953 (1,998.5 kW.)	..	145=1,062 H.P.
283	MIDDLETON	Middleton Corporation ..	1902	S. Pauls	220 & 440	Direct ..	768	640	100 A.	£39,000	6,715 (235 kW.)	18 arc, 36 cbn.	48=250 H.P.
284	MILFORD-ON-SEA ..	Milford-on-Sea Electric Supply Co., Ltd.	1906	L. Nicholson ..	230 & 460	Direct ..	100	..	240 A.H.	£8,000	..	..	..
285	MINEHEAD	Minehead Electric Supply Co. Ltd.	1903	B. W. Gothard..	220	Direct ..	141	70	14 kW.	£15,000	5,600 (187 kW.)	4 arc, 18 cbn., 4 Nernst	16=54 H.P.
286	MIRFIELD	Mirfield Urban District Council	1905	John Lomas ..	100 & 200	50~, 1-ph.	..	35	..	£4,150	..	..	7=22½ H.P.*
287	MONMOUTH	Monmouth Corporation ..	1899	F. Windsor ..	100 & 200	60~, 1-ph.	123	72.4	..	£17,906	4,885 (136 kW.)	496 cbn., 41 mtl.	10=40 H.P.
288	MONTROSE	North of Scotland Electric Light & Power Co., Ltd.	1901	F. Barritt Hills	240 & 480	Direct ..	282	145	..	£40,163	13,789 (459 kW.)	20 arc, 125 cbn., 198 Nernst	53=198 H.P.
289	MORECAMBE	Morecambe Corporation ..	1898	W. H. Hall ..	220	Direct ..	700	335	290 kW.-hrs.	£62,593	13,373 (446 kW.)	104 arc, 275 inc., 3 N.	22=99 H.P.
290	MORLEY	Morley Corporation	1898	J. E. Ellis ..	100 & 200	60~, 1-ph.	240	180	..	£29,500	..	15 arc, 36 cbn.	30=101 H.P.
291	MORPETH	Northern Counties Electricity Supply Co., Ltd.	1904	W.H. Bibby (Res.)	230 & 460	Direct ..	65	70	..	..	3,710 (124 kW.)	..	12=60 H.P.
292	MOTHERWELL	Motherwell Corporation ..	1901	S. Williams ..	230 & 460	Direct ..	1,410	643	100 kW.	£66,904	22,967 (765.5 kW.)	60 arc, 597 inc., 62 Nernst	163=1,438 H.P.
293	MUSSELBURGH ..	Musselburgh & District Elec. Light & Traction Co., Ltd.	1904	Thomas Hunter	230 & 460, tr. 500	Direct ..	600	110 lg. 200 tr.	96 kW. lg. 200 kW. tr.	£132,427	7,210 (240 kW.)	20 arc ..	18=123 H.P.
294	NELSON	Nelson Corporation	1892	D. Helme ..	230 & 460	Direct ..	1,000	735	..	£59,000	30,176 (1,006 kW.)	1 arc ..	280 H.P.
295	NEWBURY	Urban Electric Supply Co., Ltd.	1905	Herbert W. Bush	240 & 480	Direct ..	317	182	133 kW.	£49,609	11,733 (352 kW.)	..	46=163 H.P.
296	NEWCASTLE-ON-TYNE	Newcastle & District Electric Lighting Co., Ltd.	1890	W. D. Hunter ..	100 A.C.; 240 & 480 D.C.	80~, 1-ph., & direct	7,000	5,029	1,050 kW.	£534,889	..	..	..
297	NEWCASTLE-ON-TYNE	Newcastle Corporation ..	1901	Ernest Hatton ..	240 & 480, tr. 550	Direct ..	5,100	3,100	500 kW.	£1,150,701	4,942* (165 kW.)	391 arc, 37 Nernst	9=48 H.P.*
298	NEWCASTLE-ON-TYNE AND TYNESIDE	Newcastle-on-Tyne Electric Supply Co., Ltd.	1890	R. P. Sloan (Man.) J.S.Watson(Tech)	440 & 480 D.C. 440 A.C.*	40~, 3-ph., and direct	39,920	34,400	..	£1,602,899	238,900 (7,168 kW.)	8 arc, 390 cbn., 9 × 2 N.	20,300 kW.
299	NEWCASTLE-UNDER-LYME	Newcastle-under-Lyme Corporation	1904	A. J. C. de Renzi	230	Direct ..	140	63	82 kW.	£8,500	4,380 (146 kW.)	..	2=4 H.P.
300	NEWMARKET AND EXNING	Newmarket Electric Light Co. Ltd.	1899	F. A. Simpson ..	210 & 420	Direct ..	350	327	54 kW.	£39,360	22,100 (737 kW.)	12 arc ..	11=26 H.P.
301	NEWPORT & COWES	Isle of Wight Electric Light & Power Co., Ltd.	1901 and 1903	A. E. Mayes* ..	240 & 480	Direct ..	..	247	Nt. 48 kW. Cs.144 kW.	£53,935	24,015 (800.5 kW.)	30 arc, 60 cbn., 5 Nerns	56=180 kW.
302	NEWPORT (MON.) ..	Newport Corporation	1895	H. Collings Bishop	100 & 200 A.C. 230 D.C.	87.5~, 1-ph & direct	3,050*	1,870*	164 kW. for 10 hrs.	£266,124	94,573 (2,807 kW.)	177 arc, 28 mtl., 110 N.	118=1739 H.P.
303	NEWQUAY	Newquay Electric Light & Power Co., Ltd.	1903	A. S. Hawkins ..	230 & 460	Direct ..	160	92	35 kW.	£14,000	5,000 (167 kW.)	147 × 2 mtl.	1=20 H.P.
304	NEWTON ABBOT ..	Urban Electric Supply Co., Ltd.	1903	G. E. Smith ..	240 & 480	Direct ..	180	185	168 kW.	£12,137	7,176 (239 kW.)	24 arc, 1 cbn., 605 mtl.	28=160 H.P.
305	NORTHALLERTON ..	Northallerton Electric Light & Power Co., Ltd.	1899	F. R. Batty ..	220	Direct ..	150	100	32.7 kW.	£9,736	3,881 (129 kW.)	31 arc, 70 inc.	30=94½ H.P.
306	NORTHAMPTON ..	Northampton Electric Light & Power Co., Ltd.	1891	G. H. Jackson ..	210 & 420	Direct ..	1,140	745	35 kW.	£116,244	44,559 (1,485 kW.)	..	737 H.P.
307	NORTHWICH	Northwich Electric Supply Co., Ltd.	1897	W. Boyd ..	220 & 440	Direct ..	245	207	220 kW.	£32,164	15,937 (531 kW.)	57 cbn., 4 mtl.	51=317 H.P.
308	NORTON & MALTON (YORKS.)	Northern Counties Electricity Supply Co., Ltd.	1904	J. Chandler* ..	230 & 460	Direct ..	90	50	75 kW.	..	..	3 arc, 120 mtl. (×2or4), 110 N.	14=73 H.P.
309	NORWICH	Norwich Corporation.. ..	1893	F. M. Long ..	220 & 440	Direct ..	3, 24	2,434	300 kW.	£279,253	118,411 (3,947 kW.)	20 arc ..	405=2,215½ H.P.
310	NOTTINGHAM	Nottingham Corporation ..	1894	H. Talbot ..	200 & 400	Direct ..	10,043	6,156	100 kW.	£450,945	..	152 arc ..	814=3,418 H.P.
311	NUNEATON	Nuneaton Corporation ..	1900	S. C. Gibson ..	220 & 440	Direct ..	600	310	40 kW.	£32,073	..	20 arc, 20 cbn., 75 Nernst	36=131 H.P.
312	OBAN	Oban Corporation	1903	Malcolm Sutherland	230 & 460	Direct ..	180	113	50 kW.	£21,833	9,305 (310 kW.)	33 arc, 64 cbn., 118 m.l., 1 N.	18=106 H.P.
313	OGMORE VALLEY ..	Ogmore Valley Electric Light & Power Supply Co., Ltd.	1891	A. E. Marks ..	210 to 230	40~, 1-ph., & direct	150	100	..	£8,958	3,600 (120 kW.)	210 inc. ..	..
314	OLDHAM	Oldham Corporation	1894	S. W. Newington	210 & 420 tr. 500	Direct ..	5,232	2,400	..	£276,163	..	20 arc ..	..
315	OSWESTRY	Oswestry Electric Light and Power Co., Ltd.	1896	E. B. Smith ..	220	Direct ..	225	123	6.6 kW.	£12,680	5,200 (173 kW.)	..	3=12 H.P.
316	OULTON BROAD ..	Oulton Broad Electricity Co...	1902	B. Barber ..	230	Direct ..	24	18	14 kW.	£3,029	2,658 (88.5 kW.)	32 inc. ..	1=5 H.P.
317	OXFORD	Oxford Electric Co., Ltd. ..	1892	F. H. Francis ..	100	Direct, & 50~, 3-ph.	1,550	1,266	90 kW.	£183,253	84,052 (2,522 kW.)	32 arc, 48 cbn.	67 (abt. 300 H.P.)
318	PAISLEY	Paisley Corporation	1899	C. F. Parkinson..	200 A.C. tr. 500 D.C.	50~, 1 & 2-ph. & direct	2,400 lg. 1,800 tr.	814 lg. 1,000 tr.	..	£179,000	58,873 (1,962 kW.)	94 arc ..	74=536 H.P.
319	PARTICK	Partick Corporation	1902	H. B. Maxwell..	240 & 480	Direct ..	1,450	1,068	150 kW.	£110,380	53,896 (1,796.5 kH.)	233 arc, 63 inc., 111 Nernst	137=1,158 H.P.
320	PEMBERTON	Wigan Corporation	1902	James Slevin ..	230 tr. 460	Direct ..	900	190 lg. 355 tr.	75 kW.	£47,691	6,965 (232 kW.)	12 arc, 20 cbn., 8 mtl., 180 N.	5=71 H.P.
321	PEMBROKE (DUBLIN) ..	Pembroke Urban District Council	1900	S. L. R. Price ..	220 & 440	Direct ..	600	304	1,500 A.H.	£70,500	15,625 (521 kW.)	80 arc, 140 cbn., 14 mtl., 10 N.	13=45 H.P.
322	PENARTH	Penarth Electric Lighting Co., Ltd.	1901	H. Cameron ..	230 & 460	Direct ..	530	234	40 kW.	..	16,000 (533 kW.)	104 × 2 mtl.	6=15 H.P.
323	PERTH	Perth Corporation	1901	J. Lambert ..	230 & 460	Direct ..	1,175	680	276 kW.	£53,806	30,538 (1,018 kW.)	80 arc, 23 mtl.	80=250 H.P.
324	PETERBOROUGH ..	Peterborough Corporation ..	1900	J. C. Gill ..	200 & 400	Direct ..	840	508	72 kW. lg. 72 kW. tr.	£53,161	19,457 (648.5 kW.)	115 arc, 4 cbn., 45 mtl.	65=190 H.P.
325	PLYMOUTH	Plymouth Corporation ..	1899	E. G. Okell ..	100 & 200 tr. 500 D.C.	50~, 1-ph.	2,800	1,349	437 kW for 5 hrs.	£149,670	53,964 (1,799 kW.)	79 arc ..	70=200 kW.
326	PONTYPOOL	Pontypool Electric Light & Power Co., Ltd.	1898	W. J. Maybery..	103	Direct ..	169	116	25 kW.	£11,412	7,740 (258 kW.)	15 arc, 20 cbn., 4 mtl., 20 N.	14=54 H.P.
327	PONTYPRIDD	Pontypridd Urban District Council	1905	J. E. Teasdel ..	230 & 460	Direct ..	900	555	495 kW.	£55,000	15,054 (502 kW.)	40 arc ..	27=108 H.P.
328	PORTPATRICK ..	Portpatrick Electric Supply Co., Ltd.	1904	..	200 & 400	Direct ..	50	..	..	..	..	..	..
329	PORTSMOUTH	Portsmouth Corporation ..	1894	W. S. Foale ..	100	50~, 1-ph.	3,336	2,680	100 kW.	£302,000 (Mar. 1907)	6,216 kW.	328 arc,* 464 inc.	262=775 H.P.
330	PRESCOT & DISTRICT	British Insulated & Helsby Cables, Ltd.	1891	R. P. Nash ..	100 A.C., 250 & 550 D.C.	100~, 1-ph. & direct	1,760	1,335	..	£65,000	11,841 (394 kW.)	23 arc, 140 cbn., 124 mtl.	158=2,240 H.P.
331	PRESTON	National Electric Supply Co., Ltd.	1892	J. H. Tonge ..	250	50~, 1-ph., & direct	1,970	..	600 A.H.	£132,750	58,779 (1,959 kW.)	42 arc ..	..
332	PUDSEY	Pudsey Corporation	1935	Edward Denton	230 & 460	Direct ..	100	21	..	£5,315	55 kW.	20 mtl. ..	8=8 H.P.
333	QUEENSTOWN	Cork Electric Tramways & Lighting Co., Ltd.	1900	W. H. Joyce .. (Res. Eng.) H. Wilkinson ..	230 & 460	Direct ..	230	100	270 A.H.	£27,181	6,400 (192 kW.)	15 arc, 34 cbn.	6=34½ H.P.
		Radcliffe Urban District Council	1904		230 & 240 tr. 525	Direct ..	490	480	88 kW.	£23,650	4,120 (138 kW.)	12 arc, 1 mtl.	30=330 H.P.
		Ramsgate and District Elec.	1906	M. Farrar ..	240 & 480	Direct ..	290	155	150 kW.	£37,164	11,977	..	41=114 H.P.

..	40=10,000 KW. (motor-gen.)	..	..	..	Bulk supply	Flat rate	17,481,370	*Resident engineer, H. P. Gaze. Supply to Westminster & St. James Cos. Data to Dec. 31, 1907	255
36 arc ..	11,100 H.P. ..	..	29,812 KW.	7.6	Lg. 6 to 3; pr. 3 to $\frac{3}{4}$	Flat rate, sliding scale & contract	18,941,474	Data to Dec. 31, 1907	256
arc, 154 inc., 18 Nernst	320 H.P.	..	1,703.5 KW.	..	Lg. 7 & 2½, or 4; pr. 2 to 1½ ..	Max. demand, flat rate & scale	1,000,000	*200 v., A.C., 50~ 1-ph., for Eltham only	257
5 arc, 94 cbn. 3 mtl.	52=319 H.P.	..	791 KW. ..	8.5	Lg. 6 & 1¾, or 4½* ; pr. 6 to 1⅓; htg. 1	Max. dem., flat rate & sliding scale	632,253	*Pb. lg. arc £18.9, inc. (32 c.p.) £3.2 p.a. Data to Jan. and Mar. 31, 1908	258
..	.. ..	..	161 KW. ..	..	Lg. 3½	Flat rate	..	.. ..	259
arc, 290 inc., 92 Nernst	57=140 H.P.	..	628 KW.	..	Lg. 3½ to 2; pb. lg. 2; pr. 2½ to ¾	Flat rate & scale ..	..	.. ..	260
..	58=151 H.P.	..	437 KW. ..	16	Lg. 8 & 2, or 6; pr. 2½ to 1¼ (all less 5%)	Max. demand, flat rate & sl. scl. w. dis.	188,573	Data to Mar. 31, 1908	261
2 arc, 38 mtl.	48=222 H.P.	..	617 KW. ..	8.4*	Lg. 4 (factories 3) ; pb. lg. 2½ ; pr. 1	Flat rate	258,646	*Largest consumer (173 KW.) has installed private plant, also mtl. fil. lamps increasing. Data to Mar. 31, 1908	262
arc, 340 inc.	54=320 H.P.	40=1,000 H.P.	2,108 KW.	..	Lg. 4½ ; pb. lg. 3 ; pr. 2 & 1⅔ ; tr. 2½ & 2	Flat rate	936,869	Lighting & traction. Data to Sept. 31, 1907	263
2 mtl.	4=2½ H.P.	..	28 KW.	*	Lg. 7 with discounts ; pb. lg. 4 ; pr. 4	Flat rate with discounts	9,553	Data to Dec. 31, 1907	264
0 arc, 24 inc., 3 Nernst 112 N.	114=545 H.P.	..	1,142.5 KW.	..	Lg. 6 & 2, or 4 ; pb. lg. 2 ; pr. 2, 1½ & 1	Max. demand, flat rate & sl. scale	..	.. ..	265
	24=78 H.P.	..	559.6 KW.	11	Lg. 7 & 4, or 2½ ; pb.lg. £2⅞ & £2½ p.a. ; pr. 4 & 1⅓, or 2½	Max. demand & flat rate	109,620	Data to Dec. 31, 1907	266
cbn., 12 mtl.	4=15 H.P. ..	..	187 KW. ..	..	Lg. 5 ; pb. lg. inc. £2½ p.a. ; pr. 2½	Flat rate & contract	131,799	Part water power. Data to Mar. 25, 1908	267
7 inc. ..	.. ..	..	77.5 KW.	..	Lg. 4½ or 1s. per c.p. p.a. ; pb. lg. contract	Flat rate and contract	..	Part water power	268
5 arc, 104 N., 50 mtl.	33=125 H.P.	..	767 KW.	..	Lg. 5 ; pb. lg. arc £18½ to £10, inc. £3 p.a. ; pr. 2 to 1½	Flat rate and max. demand	..	.. ..	269
arc., 86 cbn., mtl., 300 N.	996 H.P. ..	40=1,000 H.P.	1,667 KW.	18	Lg. 7 & 2, or 4 ; pb. lg. 1 4 ; pr. 2 to 1 (t.sw. 1) ; tr. 1.5	Max.dem.& flat rate; pr. sl. sc. & t. sw.	1,206,973	Lighting and traction. Data to Mar. 31, 1908	270
..	12=35 H.P.	..	400 KW. ..	71.5	Lg. 6 first 2½ units per 8-C.P. per qr., all above, 4 ; pr. 3	Special scale and flat rate	85,000	Data to Mar. 31, 1908	271
arc ..	2,805=17,462 H.P.	See other table	34,507 KW. (ex. tr.)	..	Lg. 4½ & 1¾ ; pb. lg. 2 ; pr. 1½ to 1 ; tr. 1½ approx.	Max. demand and sliding scale	47,564,908	Lighting and traction, three stations. *A.C. 6,500 volts.	272
arc, 12 Nernst	69=912 H.P.	40=1,040 H.P.	2117.5 KW.	12.5	Lg. 7 & 1 ; pr. 4 & 1 (day 1) ; tr. 1½ to 1	Max. demand and 2-rate meters	1,021,785	Lighting and traction. *Including cost of destructor, £13,400. Data to Mar. 31, 1908	273
arc, 60 mtl.	5=10 H.P.	..	163 KW.	..	Lg. 4½ ; pb. lg. arc £12½, mtl. £3½ p.a.	Flat rate	60,000	Overhead mains. *Private lg. 220 volts 2-wire ; public lg. 110 volts 3-wire	274
2 arc ..	7=35 KW.	120=3,000 H.P.	700 KW. (ex. tr.)	..	Lg. 5 with discount ; pb. lg. 2½ ; pr. 3 with di-count	Flat rate with discounts	1,500,000	Lighting and traction station. Data to Sept. 30, 1907	275
..	19=84 H.P.	..	392 KW. ..	..	Lg. 7 & 4 ; pr. 2½	Max. demand & flat rate	52,631	.. ..	276
cbn., 44 Nernst	16 H.P.	..	80.5 KW.	..	Lg. 6 ; pb. lg. 3 ; pr. 3	Flat rate	19,400	*Resident engineer J. G. Campbell. Gas power. Data for 1906-7	277
rc, 158 cbn., 14 Nernst	44=129½ H.P.	..	579 KW. ..	7	Lg. 5½ ; pb. lg. £325 p.a. ; pr. 4 & 1⅓, or 2½	Lg. flat & contract ; pr. m.d. & flat	223,062	Data to Dec. 31, 1907	278
arc ..	100½ H.P.	30=990 H.P.	1,604 KW.	..	Lg. 7 & 2* ; pb. lg. £16.8 p.a. ; pr. 4½ & 1½ ; tr. 1½	Max. demand* and flat rate	642,735	Lighting and traction. *Max. average, 3¾d. Data to Dec. 31, 1907	279
inc. ..	.. ..	..	..	30	Lg. 6 ; pb. g. contract	Flat rate and contract	..	Under reconstruction	280
arc, 254 cbn.	19=59 H.P.	..	418 KW.	3·4	Lg. 3, 3½, 4 ; pb. lg. 2.08; pr. 1½, 2, 2½	Flat rates	295,029	Data to Mar. 31, 1908	281
..	145=1,062 H.P.	..	2,875 KW.	..	Lg. 6 & 2, or 4 ; pr. 2 & 1	Max. demand & flat rate	1,480,090	Motors on hire-purchase system	282
arc, 36 cbn.	48=250 H.P.	See other Table	360·5 KW. (ex. tr.)	..	Lg. 4 to 3 ; pb. lg. 3 ; pr. 2 to 1 less 5 %; tr. 1½ to 1	Flat rate and sliding scale	..	Lighting and traction. Local Traction Co. and Manchester Corporation supplied. Data to Mar. 31, 1907-	283
..	.. ..	..	.. ..	..	.. ..	..	..	Suction gas plant	284
arc, 18 cbn., 4 Nernst	16=54 H.P.	..	233 KW.	11·9	Lg. 5 ; pb. lg. 3 ; pr. 2	Flat rate	60,447	Gas power. Works removed to Alcombe ; proposed to supply Dunster. Data to Dec. 31, 1907	285
..	7=22½ H.P.*	..	125.4 KW.	20	Lg. 4½ ; pr. 2 & 1	Flat rate & sliding scale	12,412	*Fans and radiators, 5 H.P. Data to Dec. 31, 1907 ..	286
6 cbn., 41 mtl.	10=40 H.P.	..	203 KW.	6.2	Lg. 5½ ; pb. lg. 2.1 ; pr. 3 ; tr. 2	Flat rate .. .	144,282	Water power. Data to Mar. 29, 1908	287
arc, 125 cbn., 98 Nernst	53=198 H.P.	..	643 KW.	2.9	Lg. 6 & 4, or 5½ ; pb. lg. 2·9 ; pr. 4 (peak) & 1⅓, or 2½	Max. dem. flat, 2-rate meter, & contract	162,656	.. ..	288
4 arc, 275 inc., 3 N.	22=99 H.P. ..	..	633 KW.	..	Lg. 5 & 6 ; pb. lg. arc 1s. 3d. per night, inc. 4½d. p. u. ; pr. 3	Flat rate	204,145	.. ..	289
arc, 36 cbn.	30=101 H.P.	..	542 KW.	..	Lg. 4 w. dis. to 25 % ; pb. lg. arc £22 p.a. ; pr. 2½ to ¾	Flat rate with discounts	210,337	Data to Mar. 31, 1908	290
..	12=60 H.P.	..	170 KW.	..	Lg. 4 ; pr. 2½ to 1½	Flat rate	..	.. ..	291
arc, 597 inc., 62 Nernst	163=1,438 H.P.	..	2,033 KW.	..	Lg. 3½ ; pb. lg. arc £15, inc. £3¼ & £2, N. £3½ p.a. ; pr. 2 to ¾	Flat rate and sliding scale	..	.. ..	292
0 arc ..	18=123 H.P.	28=700 H.P.	344 KW.	7·9	Lg. 6 & 1⅓, or 4 ; pb. lg. 2½ ; pr. 3 & 1⅓ ; tr. 1⅓	Max. demand, flat rate & contract	493,459	Lighting and traction. Data to Dec. 31, 1907	293
arc ..	230 H.P. ..	20=500 H.P.	..	..	Lg. 4 to 3 ; pr. 2⅓ to 1⅓ less 5 % ; tr. 2	Sliding scale ..	872,534	Lighting and traction	294
..	46=163 H.P.	..	476 KW.	..	Lg. 7 & 3 ; pr. 2½ & 1	Max. demand,. flat rate & contract	224,958	Data to Dec. 31, 1907; gas and water power	295
..	.. ..	..	17,412 KW.	5 5	Lg. 3½ net; pr. 1½ max... ..	Flat rate, sliding scale, & contract	9,282,970	Large power load. Data to Dec. 31, 1907	296
1 arc, 37 Nernst	9=43 H.P.*	418=12,450 H.P.	..	..	Lg. 2 & 2½	Flat rate & sliding scale*	77,971*	Lg. and tr. *Light and power supplied to public buildings only. Data for 1906-7	297
rc, 390 cbn., 9 × 2 N.	20,300 KW.	Tr. 11,330 KW. Blk. 30,732 KW.	69,573 KW.	33·6	Lg. 3⅔ less 5%; pb. lg. arc £20, inc. £2/15/6 p.a. ; pr. 1½ w. dis.	Flat rate	..	Lg. & tr. Cons. Engs., Merz & McLellan. See "Power Dist. Cons." *Tr. 500 & 600 v. Data to Dec. 31, 1907	298
..	2=4 H.P. ..	..	149·5 KW.	12	Lg. 6 ; pr. 3	Flat rate	45,608	Gas power ; town's gas at 2s. 3d. per 1,000 cubic ft. Data to Mar. 31, 1908	299
arc ..	11=36 H.P.	..	757 KW.	4·5	Lg. 7 & 4, or 6 ; pb. lg. arc £12 p. a. ; pr. 4 & 1½	Max. demand and flat rate	164,178	Data to Dec. 31, 1907	300
arc, 60 cbn., 5 Nernst	56=180 KW.	..	1,057 KW.	9	Lg. 7 & 4, or 6 ; pr. 4 & 1⅓, or 2½	Max. demand and flat rate	302,712	Supply from N. to C. at 2,500 volts D.C. *A. Crawford & G. C. Maclaren, asst. engrs. Data to Dec., 1907	301
77 arc, 28 mtl., 110 N.	118=1732 H.P.	82=1,560 H.P.	5,920 KW.	..	Lg. 4 & 3 ; pb. lg. arc £16, N. £27 p.a. ; pr. 2 to 1 ; htg. 1 ; tr. 1.35	Flat w. dis., sl. sc., 2-rate meter & time sw.	3,578,690	Lighting and traction. *Two gen. stns. ; energy sold to tramways. Data to Mar. 31, 1908	302
7 × 2 mtl.	1=20 H.P. ..	..	170 5 KW.	37	Lg. 6 ; pr. 3	Flat rate & contract	..	.. ..	303
arc, 1 cbn., 605 mtl.	28=160 H.P.	..	466·6 KW.	11	Lg. 7 & 3, or 6 ; pr. 4 & 1⅓, or 2½ ; pb. lg. contract	Max. demand, flat rate and contract	231,011	.. ..	304
arc, 70 inc.	30=94½ H.P.	..	267 KW.	..	Lg. 6 ; pr. 4 to 1½*	Flat rate w. dis., sl. scale & contract	70,272	*Pb. lg. arc 13/-, inc. 3/9 & 3/-, per 100 hrs.	305
..	737 H.P. ..	..	2,222 KW.	12	Lg. 6 & 3, or 5 (pr. ho. 4½) ; pr. 2 to 1 ; htg. 1½	Max. demand, flat rate & sl. scale*	837,162	*Also fixed charge on net assmt. (4% winter & 2½% smr. qrs.) & 1½ p.u. for domestic purposes. Data to Dec. 31, '07	306
cbn., 4 mtl.	51=317 H.P.	..	835 KW.	12·6	Lg. 6 & 4 ; pb. lg. 2½ ; pr. 2 and 1	Max. demand and flat ra e	242,623	A. W. Sclater, Cons. Eng. Mond gas power	307
rc, 120 mtl. 2or4), 110 N.	14=73 H.P.	..	133 KW. (approx.)	..	Lg. 4½ ; pb. lg. £375½ p.a. ; pr. 2½ to 1¼	Flat rate, contract and sl. scale	..	Gas power. *C. W. Fairweather (Con.)	308
arc ..	405=2,215½ H.P.	..	6,219 KW.	9	Lg. 4½* ; pb. lg. 1 ; pr. 3 to ¾ ..	Flat rate, sliding scale & special*	3,661,522	Purchased from Co. in 1902. *Also 12% on assessment and 1d. p.u. Data to Mar. 31, 1908.	309
2 arc ..	814=3,413 H.P.	..	11,657 KW.	8·86	Lg. 5 & 1⅓ ; pb. lg. 5 & 1⅓ ; pr. 1⅓ ; tr. 1⅓	Max. demand & flat rate	11,116,835	Lighting and traction. Data to Mar. 31, 1908	310
arc, 2) cbn., 75 Nernst	36=131 H.P.	..	833 KW.	11·9	Lg. 6 & 3, or 5 to 3 ; pb. lg. arc £8, N. 3½ p.a. ; pr. 3 & 1 or 2½ to 1	Max. demand, flat rate & sliding scale	330,030	Data to March 31, 1908	311
arc, 64 cbn., 8 m l., 1 N.	18=106 H.P.	..	352 KW.	17	Lg. 6 ; pr. 3	Lg. flat rate, pr. sl. scale, with dis.	89,521	.. .. :	312
0 inc. ..	.. ..	..	133 KW.	..	Lg. 3, 4, 4½ ; pb. lg. contract ..	Sliding scale & contract	..	.. ..	313
arc ..	.. ..	See other Table	2,604 KW. (ex. tr.)	..	Lg. 4 & 1½ ; pb. lg. 2½ ; pr. 2 to 1 ; tr. 1½	Max. demand, flat rate & sl. scale	4,133,615	Lighting and traction	314
..	3=12 H.P. ..	..	183 KW. ..	..	Lg. 7 & 3 ; pr. 3 (minimum 10/- per H.P.)	Max. demand and flat rate	119,514	.. ..	315
inc. ..	1=5 H.P. ..	..	96 KW. ..	3.3	Lg. 6½ ; pb. lg. £2½ p.a. ; pr. 3..	Flat rate with rebate	22,000	.. ..	316
arc, 49 cbn.	67 (abt. 300 H.P.)	..	2,731 KW.	11.3	Lg. 6 w. dis. ; pb. lg. 2½ ; pr. 3 to 2 w. dis.	Flat rate with discount	1,115,112	Data to Dec. 31, 1907	317
arc ..	74=536 H.P.	100=2,500 H.P.	2,445 KW. (ex. tr.)	15	Lg. 4 ; pb. lg. arc £25 p.a. ; pr. 1½ to ⅔ ; tr. 2 to 1½	Flat rate & sliding scale	2,783,069	Lighting and traction. Data to May 15, 1908	318
arc, 63 inc., 11 Nernst	137=1,158 H.P.	..	2,870 KW.	..	Lg. 3½, or 6 & 1 ; pb. lg. 0.9; pr. 1	Flat rate & max. demand	1,748,614	.. ..	319
rc, 20 cbn., ati., 180 N.	5=71 H.P. ..	24=840 ..	273·5 KW.	..	Lg. 5, 4, 3 ; pb. lg. 3 ; pr. 2 to 1 ; tr. 1.4	Flat rate with disc., & time sw.	744,795	Lighting and traction. Data to Mar. 31, 1908	320
rc, 140 cbn., mtl., 10 N. × 2 mtl.	13=45 H.P.	..	615 KW. ..	15.2	Lg. 4½ ; pb. lg. arc £20, inc. £3½ p.a. ; pr. 4½ & 1⅓ ; htg. 1½	Flat rate, 2-rate meter & contract	291,088	Data to Dec. 31, 1907	321
	6=15 H.P. ..	..	553 KW. ..	36	Lg. 7 & 2 (arc 3) ; pb. lg. 5½. per lp. p.a. ; pr. 4½ & 1⅓	Max. dem., flat r., sl. scale, & contract	159,047	Data to Dec. 31, 1907	322
arc, 28 mtl.	80=250 H.P.	24=840 H.P.	1,373 KW. (ex. tr.)	5.5	Lg. 3⅜ to 2¼ ; pb. lg. 1½ ; pr. 2 to 1½ ; tr. 1½	Flat rate	834,359	Lighting and traction. Data to April 27, 1908	323
arc, 4 cbn., 45 mtl.	65=190 H.P.	28=560 H.P.	1,357 KW.	10½	Lg. 4½ & 4 ; pb. lg. £12 ; pr. 1⅓ ; tr. 2½ to 1¼	Flat rate and sl. scale	580,996	Lighting and traction. Data to Mar. 31, 1908	324
arc ..	70=209 KW.	74=1,388 KW.	3,633 KW.	..	Lg. 3⅜ to 2¼ ; pb. lg. arc £21 p.a. ; pr. 1½ ; tr. 1½	Flat rate and 2-rate meter	1,922,684	Lighting and traction	325
rc, 20 cbn., ati., 20 N.	14=54 H.P.	..	300 KW. ..	4	Lg. 6 ; pb. lg. 3 ; pr. 3 & 2 ..	Flat rate	88,564	Data to Dec. 31, 1907	326
arc ..	27=108 H.P.	40=1,480 H.P.	696 KW. ..	100	Lg. 7 & 1, or 3½ (sc.) ; pb. lg. 1½ ; pr. 1½ & 1 ; tr. 1½	Max. demand and sliding scale	682,516	Lighting and traction. Data to Mar. 31, 1907	327
..	.. ..	..	..	5..	.. ..	..	..	.. ..	328
5 arc,* 464 inc.	262=773 H.P.	..	6,935 KW.	..	Lg. 4½ ; pb. lg. arc £18 (flame £10), inc. £3 3s. p.a. ; pr. 1½	Flat rate & sliding scale	3,294,050	Lighting station only. *365 large arcs, 58 flame arc. Da a to Mar. 31, 1908.	329
rc, 140 cbn., 24 mtl.	158=2,240 H.P.	8=200 H.P.	3,075 KW.	2.5	Lg. 4 ; pb. lg. 2 ; pr. 1 ; tr. 1⅝ less discount	Flat rate	2,974,770	Lg. and traction. Supply to Prescot Dist., S. Lanc. Trys. and B.I. & H.C. works. Data to Dec. 31, 1907	330
arc ..	.. ..	..	1,980 KW.	..	Lg. 4 & 2 ; pr. 1½	Max. demand & sliding scale	..	.. ..	331
mtl. ..	8=8 H.P. ..	..	61 KW. ..	..	Lg. 4 ; pb. lg. 3 ; pr. 2	Flat rate	20,393	Large consumers supplied by the Yorkshire Electric Power Co. Data to Dec. 31, 1907	332
rc, 24 cbn.	6=34½ H.P.	..	227 KW. ..	5	Lg. 6, 5 & 4½ ; pb. lg. arc £15, inc. £2 8s. (½ night)	Flat rate	128,321	Data to Dec. 31, 1907	
re, 1 mtl.	30=330 H.P.	See other Table	429·0 KW. (ex. tr.)	40	Lg. 4 to 3 ; pb. lg. 2 ; pr. 2 to 0.9 ; tr. 1½	Sliding scale ..	773,249	Lighting and traction. Data to Mar. 31, 1908	
..	41=134 H.P.	..	..	..	.. .. ..	..	..	.. .. ..	

321	PEMBROKE (DUBLIN) ..	Pembroke Urban District Council	1900	S. L. R. Price ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	(521 KW.)	14 mtl., 10 N.	[illegible]
322	PENARTH	Penarth Electric Lighting Co., Ltd.	1901	H. Cameron ..	230 & 460	Direct ..	530	234	40 KW.	..	16,000 (533 KW.)		104 × 2 mtl.	6=15 H.P. ..
323	PERTH	Perth Corporation	1901	J. Lambert ..	230 & 460	Direct ..	1,175	680	276 KW.	£53,806	30,538 (1,018 KW.)		80 arc, 28 mtl.	80=250 H.P.
324	PETERBOROUGH ..	Peterborough Corporation ..	1900	J. C. Gill ..	200 & 400	Direct ..	840	508	72 KW. lg. 72 KW. tr.	£53,161	19,457 (648.5 KW.)		115 arc, 4 cbn., 45 mtl.	65=190 H.P.
325	PLYMOUTH	Plymouth Corporation ..	1899	E. G. Okell ..	100 & 200 tr. 500 D.C.	50~, 1-ph.	2,800	1,349	237 KW for 5 hrs.	£149,670	59,964 (1,999 KW.)		79 arc ..	70=209 KW.
326	PONTYPOOL	Pontypool Electric Light & Power Co., Ltd.	1898	W. J. Maybery..	103	Direct ..	169	116	25 KW.	£11,412	7,740 (258 KW.)		15 arc, 20 cbn., 4 mtl., 20 N.	14=54 H.P.
327	PONTYPRIDD	Pontypridd Urban District Council	1905	J. E. Teasdel ..	230 & 460	Direct ..	900	555	495 KW.	£55,000	15,054 (502 KW.)		40 arc ..	27=108 H.P.
328	PORTPATRICK ..	Portpatrick Electric Supply Co., Ltd.	1904	..	200 & 400	Direct ..	50	..	..	..	..		..	..
329	PORTSMOUTH	Portsmouth Corporation ..	1894	W. S. Foale ..	100	50~, 1-ph.	3,336	2,680	100 KW.	£302,000 (Mar. 1907)	6,216 KW.		323 arc,* 464 inc.	232=773 H.P.
330	PRESCOT & DISTRICT	British Insulated & Helsby Cables, Ltd.	1891	R. P. Nash ..	100 A.C., 250 & 550 D.C.	100~, 1-ph. & direct	1,760	1,335	..	£55,000	11,821 (394 KW.)		23 arc, 140 cbn., 124 mtl.	158=2,240 H.P.
331	PRESTON	National Electric Supply Co., Ltd.	1892	J. H. Tonge ..	250	50~, 1-ph., & direct	1,970	..	600 A.H.	£182,750	58,779 (1,959 KW.)		42 arc ..	..
332	PUDSEY	Pudsey Corporation	1905	Edward Denton	230 & 460	Direct ..	100	21	..	£5,315	55 KW.		20 mtl. ..	8=8 H.P. ..
333	QUEENSTOWN	Cork Electric Tramways & Lighting Co., Ltd.	1900	W. H. Joyce .. (Res. Eng.)	230 & 460	Direct ..	230	100	270 A.H.	£27,181	6,400 (192 KW.)		15 arc, 24 cbn.	6=34½ H.P.
334	RADCLIFFE	Radcliffe Urban District Council	1904	H. Wilkinson ..	220 & 240 tr. 525	Direct ..	490	480	88 KW.	£23,650	4,620 (138 KW.)		12 arc, 1 mtl.	30=330 H.P.
335	RAMSGATE	Ramsgate and District Electric Supply Co., Ltd.	1905	M. Farrer ..	240 & 480	Direct ..	290	155	150 KW.	£37,164	11,977 (399 KW.)		..	41=114 H.P.
336	RATHMINES	Rathmines Urban District Council	1900	G. F. Pilditch ..	220 & 440	Direct ..	750	377	400 KW	£107,798	25,021 (837 KW.)		109 arc, 422 inc., 45 Nernst	7=42 H.P. ..
337	READING	Reading Electric Supply Co., Ltd.	1895	E. Rowley Hill..	200&400 D.C. 200 A.C.	Direct, & 67~, 1-ph.	2,150	1,377	200 KW.	£167,061	64,559 (2,152 KW.)		..	244=1,537 H.P.
338	REDDITCH	Redditch Urban District Council	1899	W. J. Ferguson..	200	66~, 1-ph.	544	350	..	£36,739	8,773 (292.4 KW.)		320 inc. ..	25=163 H.P.
339	REIGATE	Reigate Corporation	1901	W. S. Ross ..	200	50~, 1-ph.	480	243	..	£45,030	22,177 (739 KW.)		4 arc, 2 mtl.	14=53 H.P.
340	RHYL	Rhyl Urban District Council	1901	E. H. Wright ..	220	Direct ..	495	221	32 KW.	£26,990	11,257 (375 KW.)		58 arc, 8 inc.	19=20 H.P.
341	RICHMOND (SURREY)..	Richmond (Surrey) Electric Light & Power Co., Ltd.	1893	L. C. B. Trimnell	110 & 220	Direct ..	1,150	540	55 KW.	£129,439	57,755 (1,925 KW.)		..	102=460 H.P.
342	ROCHDALE	Rochdale Corporation ..	1900	C. C. Atchison ..	220 & 440, tr. 500	Direct* ..	2,476	698 lg. 1,225 tr.	180 A.H.	£88,247	37,221 (1,241 KW.)		..	171=1,007 H.P.
343	ROSS	Ross Electric Light & Power Co., Ltd.	1902	Chas. E. Gray ..	230	Direct ..	100	38.6	50 KW.	£5,652	2,863 (95.4 KW.)		2 Nernst, 4 mtl.	5=10 H.P. ..
344	ROTHERHAM	Rotherham Corporation ..	1901	Edward Cross ..	230 & 460, tr. 540	Direct ..	1,208	968 (inc. tr.)	46 KW.	£50,330	22,873 (762.5 KW.)		..	58=891 H.P.
345	ROTHESAY	Rothesay Corporation ..	1899	E. B. Stiven ..	230 & 460	Direct ..	34	24	..	£3,000	..		36 arc, 34 inc.	..
346	ROTTINGDEAN	New Rottingdean Electricity Co., Ltd.	1895	A. Jupp	100	Direct ..	43	..	..	..	1,000 (33 KW.)		14 inc. ..	1 H.P. ..
347	ROUNDHAY	Roundhay & District Electric Lighting Co., Ltd.	1903	H. Fox	230 & 460	Direct ..	160	134	600 KW.-hrs.	£14,000	6,943 (231.5 KW.)		30 Nernst ..	10 H.P. ..
348	RUGBY	Rugby Urban District Council	1903	T. S. Shenton ..	220	50~, 3-ph.	210	190	..	£13,388	12,235 (408 KW.)		..	14=29 H.P.
349	RUGBY SCHOOL ..	Rugby School Electric Lighting Co., Ltd.	1896	A. E. Lee ..	100	100~, 1-ph.	85	60	..	£4,500	5,000 (167 KW.)		..	..
350	RYDE & ST. HELENS ..	Isle of Wight Elec. Lt. & Pr. Co., & St. Helens El. Lg. Co.	1903	A. E. Mayes* ..	240 & 480	Direct, & 50~, 1-ph.	295	140	144 KW.	£61,619	15,784 (526 KW.)		55 cbn. ..	44=70 H.P. ..
351	ST. ANDREWS ..	Electric Supply Corporation, Ltd.	1905	K. A. Scott-Moncrieff*	225 & 450	Direct ..	300	55	80 KW.	£22,000	6,528 (217.6 KW.)		4 arc, 8 cbn.	61 H.P. ..
352	ST. ANNE'S-ON-SEA ..	St. Annes-on-Sea Urban District Council	1901	J. H. Clothier ..	240	Direct ..	750	380 tr., 315 lg.	13 KW.	£43,200 (approx.)	27,502 (917 KW.)		44 arc, 25 cbn., 102 mtl., 178 N.	30=56 H.P.
353	ST. AUSTELL	St. Austell & District Electric Lighting & Power Co., Ltd.	1886	A. B. Child ..	110 & 220	Direct ..	100	47	46 KW.	£8,000	1,930 (64 KW.)		..	9=4½ H.P. ..
354	ST. HELENS	St. Helens Corporation ..	1896	E.M.Hollingsworth	230 & 460 tr. 500	Direct ..	1,340	988	510 KW.	£148,700	38,427 (1,281 KW.)		161 Nernst	213=1,478 H.P.
355	SALE	Sale Urban District Council..	1903	C. J. Wood ..	230 & 460	Direct ..	100	54	80 KW.	£9,283	8,950 (298 KW.)		5 arc, 5 cbn., 120 mtl.	5=12 H.P. ..
356	SALFORD	Salford Corporation	1895	Victor A. H. M'Cowen	220, 440 D.C., 200 A.C., tr500	75~, 1-ph., & direct	7,520	6,776	154 KW.	£598,000	172,200 (5,740 KW.)		117 arc ..	907=9,230 H.P.
357	SALISBURY	Salisbury Electric Light & Supply Co., Ltd.	1898	A. B. Randall ..	210	Direct ..	600	316	134 KW.	£69,607	29,370 (979 KW.)		19 inc., 14 Nernst	57=148½ H.P.
358	SALTBURN	Cleveland Trust, Ltd... ..	1899	A. Raine ..	220	Direct ..	170	79	92 KW.	£14,000	9,500 (317 KW.)		..	10=20 H.P. ..
359	SCARBOROUGH ..	Scarborough Electric Supply Co., Ltd.	1893	F. G. Holden ..	200 A.C. 500 D.C.	80~, 1-ph., & direct	1,945	902	175 KW.	£108,261	55,412 (1,847 KW.)		..	234 H.P. ..
360	SHANKLIN & SANDOWN	Isle of Wight Electric Light & Power Co., Ltd.	1901	A. E. Mayes* ..	240 & 480	Direct ..	425	214	40 KW.	£56,081	14,590 (486 KW.)		15 arc, 321 cbn., 66 Nernst	37=35 H.P.
361	SHEERNESS AND QUEENBOROUGH	Sheerness & District Elec. Power & Traction Co., Ltd.	1903	A. A. Watkins ..	230 & 460 D.C., 300 A.C.*	Direct, & 50~ 3-ph.	500	323	40 KW.	..	9,070 (302 KW.)		..	161 H.P. ..
362	SHEFFIELD	Sheffield Corporation.. ..	1894	S. E. Fedden ..	200	50~, 2-ph.	7,500	6,243	..	£890,000 (inc. purch.)	266,595 (8,331 KW.)		20 arc ..	1,037=9,674 H.P.
363	SHILDON	Northern Counties Electricity Supply Co., Ltd.	1905	T. Heron ..	230 & 460	Direct ..	150	..	250 A.H.	..	..		..	..
364	SHIPLEY	Shipley Urban District Council	1901	S. D. Schofield	230 & 460 tr. 500	Direct ..	1,170	694	750 A.	£62,763	(516 KW.) 15,488		41 arc, 1 Nernst	89=680 H.P.
365	SHREWSBURY	Shrewsbury Corporation ..	1896	C. M. Johnston	210 & 420	Direct ..	780	361	..	£52,000 (estd.)	22,000* (733 KW.)		51 arc, 220 mtl. & cbn.	150 H.P. ..
366	SLEAFORD	Sleaford Urban District Council	1902	W. Henry Wilson	220	Direct ..	180	72	18 KW.	£11,143	3,370 (112 KW.)		16 arc, 104 cbn., 12 mtl., 6 N.	10=34 H.P.
367	SLOUGH & DATCHET	Slough and Datchet Electric Supply Co., Ltd.	1903	A. E. Farrow ..	220 & 440	Direct ..	580	250	88 KW.	£44,886	10,447 (348 KW.)		103 mtl. ..	27 .. ..
368	SMETHWICK	Birmingham & Midland Tramways Joint Committee	1904	S. A. Mahood ..	250 & 500 D.C. 5,500 A.C.	25~, 3-ph., & direct	2,400	1,200	..	..	2,386 (79.5 KW.)		..	..
369	SOUTHAMPTON ..	Southampton Corporation .	1891	H. F. Street ..	200	Direct ..	2,200	1,470	1,500 KW.	£179,351	54,969 (1,832 KW.)		92 arc, 66 inc., 6 Nernst	40=280 H.P.
370	SOUTHEND-ON-SEA ..	Southend Corporation ..	1902	Robert Birkett ..	230 & 460, tr. 500	Direct ..	1,775	1,429	50 KW.	£115,000 (approx.)	..		99 arc, 74 cbn., 4 mtl., 115 N.	..
371	SOUTHPORT	Southport Corporation ..	1894	R. S. Downe ..	100 & 210 A.C. 500 D.C.	50~, 1-ph., & direct	2,350	1,557	400 KW.	£191,273	101,883 (3,396 KW.)		71 arc, 150 inc.	56=375 H.P.
372	SOUTH SHIELDS ..	South Shields Corporation ..	1896	J. H. Cawthra ..	110 & 220 tr. 550 D.C.	50~, 1-ph.	2,700	1,776	517 KW.	£177,438	64,671 (2 155 KW.)		94 arc, 480 × 2 cbn.	1,000 H.P. ..
373	SPENNYMOOR	Northern Counties Electricity Supply Co., Ltd.	1902	C. W. Fairweather	230 & 460	Direct ..	400	136	400 A.H.	£42,032	9,492 (316.5 KW.)		281 Nernst	129 H.P. ..
374	STAFFORD	Stafford Corporation	1896	H. Pooley ..	210 & 420	Direct ..	565	254	300 KW.	£33,063	..		8 arc ..	56 H.P. ..
375	STALYBRIDGE	Stalybridge, Hyde, Mossley, & Dukinfield Tr. & El. Bd.	1904	Robert Blackmore	230 D.C., 400 A.C., tr. 500	40~, 3-ph., & direct	5,500	2,500	..	£225,000	15,000 (500 KW.)		..	200=4,000 H.P.
376	STAMFORD .. .	Urban Electric Supply Co., Ltd.	1902	J. E. Edmundson	240 & 480	Direct ..	380	207½	600 A.H.	£51,498	16,734 (558 KW.)		5 arc, 10 cbn.	88=496 H.P.
377	STIRLING	Stirling Corporation	1900	J. W. Papworth	230 & 460	Direct ..	638	285	90 KW.	£40,150	18,996 (567 KW.)		60 arc, 96 cbn., 53 mtl., 65 N.	68=220 H.P.
378	STOCKPORT	Stockport Corporation ..	1898	R. Lonax ..	230 & 460 tr. 500	Direct ..	2,050	1,440	200 KW.	£51,000	26,766 (892 KW.)		49 arc, 2 inc., 1 Nernst ..	73=428 H.P.
379	STOCKTON-ON-TEES ..	Stockton-on-Tees Corporation	1900	J. J. Smith ..	230 & 460	Direct ..	1,050	515	75 KW.	£52,500	23,100 (770 KW.)		44 arc ..	104=760 H.P.
380	STOKE-UPON-TRENT ..	Stoke-upon-Trent Corporation	1904	P. J. S. Tiddeman	240 & 480	Direct ..	600	274	50 KW.	£28,800	15,341 (491 KW.)		..	622 H.P. ..
381	STOWMARKET	Suffolk Electricity Supply Co.,	1896	Napier Prentice	100	Direct ..	78	39	13.5 KW.	..	2,500 (83 KW.)		..	24=37 H.P.
382	STRATFORD-ON-AVON	Stratford-on-Avon Electricity Co., Ltd.	1907 (April)	Cecil D. Falcke	230 & 440	Direct ..	100	47	47 KW.	£8,400	2,640 (88 KW.)		..	12=102 H.P.
383	STRETFORD	Stretford Urban District Council	1903	R. Rowland ..	230 & 440, tr. 550	Direct ..	1,500	1,004	200 KW.	£60,000	14,476 (482.5 KW.)		98 arc, 76 mtl.	44=201 H.P.
384	SUNDERLAND	Sunderland Corporation ..	1895	A. S. Blackman	220 D.C. 240 A.C.	Direct & 50~, 3-ph.	5,530	3,746	About 320 KW.	£326,494	91,809 (3,060 KW.)		173 arc, 24 inc., 24 Nernst	947=8,526 H.P.
385	SURBITON	Surbiton Urban District Council*	1903	H. MacDonald Gill (resident)	240 & 480	Direct ..	380	197	90 KW.	£52,066	26,037 (869 KW.)		2 Nernst ..	18=30½ H.P.
386	SUTTON, CARSHALTON WALLINGTN & CHEAM	South Metropolitan Electric Tramways & Lighting Co.	1902	C. W. Durnford (Chf. Eng.)*	200 A.C., tr. 500 D.C.	50~, 1-ph., & direct	1,500	560	..	£80,538	32,141 (964 KW.)		2 arc, 193 mtl., 2 Nernst	11=108 H.P.
387	SUTTON COLDFIELD ..	Sutton Coldfield Corporation	1901	T. Duesbury ..	230 & 460	Direct ..	625	241	90 KW.	£41,309	20,559 (685 KW.)		14 arc, 149 cbn., 54 mtl.	25=76 KW.
388	SWANSEA	Swansea Corporation.. ..	1901	C. A. L. Prusmann	230 & 440 tr. 550	Direct and 50~, 1-ph.	2,325	918 (ex. tr.)	78 KW.	£136,903 approx.	2,156 KW.		74 arc, 80 mtl.	1,536 H.P. ..
389	SWINDON	Swindon Corporation.. ..	1903	A. Dimmack ..	220 & 440 tr. 500	Direct ..	900	665	350 A.H.	£58,929	23,231 (774 KW.)		21 arc, 173 cbn., 12 × 2 mtl.	243 H.P. ..
390	TAUNTON	Taunton Corporation.. ..	1888*	E. B. Thornhill	105 & 210 tr. 560 D.C.	60~, 1-ph., & direct	1,100	564	..	£70,111	27,889 (930 KW.)		72 arc, 292 mtl.	98=278 H.P.
391	THIRSK AND SOWERBY	Northern Counties Electricity Supply Co., Ltd.	1903	C. W. Fairweather	230 & 460	Direct ..	95	30	..	£9,133	1,602 (53.5 KW.)		186 Nernst	..
392	TODMORDEN	Todmorden Corporation ..	1905	Henry Talbot ..	230	Direct ..	225	103	13.8 KW.	£20,000	5,650 (188 KW.)		..	31=55 KW.
393	TONBRIDGE	Tonbridge Urban District Council	1902	M. P. Plunkett	220	Direct ..	120	94	150 KW.	£23,421	6,364 (212 KW.)		18 arc, 63 Nernst, 4 mtl.	12=41 H.P.
394	TONYREFAIL AND GILFACH GOCH	Tonyrefail & Gilfach Goch El. Light & Power Co. Ltd.	1904	Arthur J. Arthur	220	50~, 1-ph.	75	70	..	£5,000	1,200 (40 KW.)		204 inc. ..	..
395	TOPSHAM .. .	Topsham Electricity Supply Co., Ltd.	1905	H. C. Gould ..	100	Direct .	7	18.5	14 KW.	£1,874	1,392 (46.5 KW.)		66 mtl.	7=14 H.P. ..
396	TORQUAY	Torquay Corporation.. ..	1898	P. Storey ..	200	50~, 1-ph.	625	318	..	£46,940	22,890 (763 KW.)		53 arc, 307 inc., 150 Nernst	6=15 H.P. ..
397	TOTNES	Totnes Electricity Supply Co., Ltd.	1904	K. A. Scott-Moncrieff*	225 & 450	Direct ..	66	34.5	35 KW.	£12,600	2,452 (81.7 KW.)		..	4=7 H.P. ..
398	TRAFFORD PARK & SALE	Trafford Power & Light Supply (1902) Ltd.	1899	J. J. McGregor..	250 & 500 D.C. 3,000 A.C.	Direct & 30~, 3-ph.	3,100*	2,548	..	£156,500	..		..	..
399	TREETON	Treeton Parish Council ..	1897	W. H. Barwell..	1,250	Direct ..	13	..	..	..	..		25 arc ..	..
	.. .. ..	Tunbridge Wells Corporation	1895	H. Boot (Cons.) D. Smith (Res. Eg.)	220	67.5~, 1-ph.	1,300	692	..	£81,826	58,530 (1,951 KW.)		79 arc, 157 cbn., 69 mtl.	30=82 H.P.

ntl., 10 N. × 2 mtl.	6=15 H.P.	..	553 KW.	36	Lg. 4½; pb. lg. arc £20, inc. £3½ p.a.; pr. 4½ & 1½; htg. 1½	Max. dem., flat r., sl. scale, & contract	159,017	Data to Dec. 31, 1907	322
rc, 23 mtl.	80=250 H.P.	24=840 H.P.	1,973 KW. (ex. tr.)	5.5	Lg. 3½ to 2½; pb. lg. 1½; pr. 2 to 1½; tr. 1½	Flat rate	834,359	Lighting and traction. Data to April 27, 1908	323
rc, 4 cbn., 45 mtl.	65=190 H.P.	28=560 H.P.	1,357 KW.	10½	Lg. 4½ & 4; pb. lg. £12; pr. 1½; tr. 2½ to 1½	Flat rate and sl. scale	580,996	Lighting and traction. Data to Mar. 31, 1908	324
rc	70=209 KW.	74=1,388 KW.	3,633 KW.	..	Lg. 3½ to 2½; pb. lg. arc £21 p.a.; pr. 1½; tr. 1½	Flat rate and 2-rate meter	1,922,684	Lighting and traction	325
e, 20 cbn., ti., 20 N.	14=54 H.P.	..	300 KW.	4	Lg. 6; pb. lg. 3; pr. 3 & 2	Flat rate	88,564	Data to Dec. 31, 1907	326
rc	27=108 H.P.	40=1,480 H.P.	696 KW.	100	Lg. 7 & 1, or 3½ (sc.); pb. lg. 1½; pr. 1½ & 1; tr. 1½	Max. demand and sliding scale	682,516	Lighting and traction. Data to Mar. 31, 1907	327
									328
arc,* 464 nc.	252=773 H.P.	..	6,935 KW.	..	Lg. 4½; pb. lg. arc £18 (flame £10), inc. £3 3s. p.a.; pr. 1½	Flat rate & sliding scale	3,294,050	Lighting station only. *365 large arcs, 58 flame arc. Da a to Mar. 31, 1908.	329
e, 140 cbn., 24 mtl.	153=2,240 H.P.	8=200 H.P.	3,075 KW.	2.5	Lg. 4; pb. lg. 2; pr. 1; tr. 1⅝ less discount	Flat rate	2,974,770	Lg. and traction. Supply to Prescot Dist., S. Lanc. Trys. and B.I. & H.C. works. Data to Dec. 31, 1907	330
rc	..	..	1,980 KW.	..	Lg. 4 & 3; pr. 1½	Max. demand & sliding scale	..		331
tl.	8=8 H.P.	..	61 KW.	..	Lg. 4; pb. lg. 3; pr. 2	Flat rate	20,393	Large consumers supplied by the Yorkshire Electric Power Co. Data to Dec. 31, 1907	332
rc, 24 cbn.	6=34½ H.P.	..	227 KW.	5	Lg. 6, 5 & 4½; pb. lg. arc £15, inc. £2 8s. (½ night)	Flat rate	128,321	Data to Dec. 31, 1907	333
rc, 1 mtl.	30=330 H.P.	See other Table	429·0 KW. (ex. tr.)	40	Lg. 4 to 3; pb. lg. 2; pr. 2 to 0.9; tr. 1⅞	Sliding scale	773,249	Lighting and traction. Data to Mar. 31, 1908	334
	41=114 H.P.	..	588 KW.	45	Lg. 7 & 3; pr. 2 (daylight 1½)	Max. dem., flat rate, 2-rate meter (pr.)	146,269	Data to Dec. 31, 1907	335
arc, 422 45 Nernst	7=42 H.P.	..	1,026 KW.	11	Lg. 4½ (sch. & ch. 4); pb. lg. arc £15, inc. £4½ p.a.; pr. 1½	Flat rate	683,467	Data to Mar. 31, 1908	336
inc.	244=1,597 H.P.	..	3,689 KW.	11	Lg. 6 (shops 4½ to 3); pr. 1½	Sliding scale	1,180,590	Data to Dec. 31, 1907	337
c, 2 mtl.	23=163 H.P.	..	1,004 KW.	..	Lg. 4½ & 4; pb. lg. inc. £3 p.a.; pr. 2-1½, 1½ & 1; htg. 1½	Flat rate, 2-rate meter, sl. sc. for pr.	..	Part gas power	338
re, 8 inc.	14=53 H.P.	..	792 KW.	..	Lg. 7 & 4; pb. lg. arc £18, inc. £2 15s. p.a.; pr. 2	Max. demand & flat rate	230,427		339
	19=20 H.P.	..	480 KW.	..	Lg. 6 & 3, or 5; pb. lg. 4; pr. 4 & 2	Max. demand & flat rate	..		340
..	102=460 H.P.	..	2,269 KW.	..	Lg. 5½; pr. 2½; htg. 1½	Flat rate with discounts	638,173	Data to Dec. 31, 1907	341
..	171=1,007 H.P.	120=4,260 H.P.	2,129 KW. (ex. tr.)	36	Lg. 6 & 2, or 4½ with dis.; pr. 2 to ¾; tr. 1½ to 1	Max. dem., flat r., sl. sc., & contract	3,264,723	Lighting and traction. *3-phase 50~ at 3,000 volts sub-stations. Data to Mar. 31, 1908	342
Nernst, 4 mtl.	5=10 H.P.	..	103 KW.	..	Lg. 7; pb. lg. 6½; pr. 3	Flat rate	26,047	Met. filament lamps in extended use	343
..	58=391 H.P.	62=1,550 H.P.	2,371.5 KW. (inc. tr.)	5.7	Lg. 4; pr. 1½ to 1; tr. 1½	Flat rate, with discounts	1,698,174	Lighting and traction. Data to Mar. 31, 1908	344
arc, 34 inc.	..	..	..	..		..	..		345
inc.	1 H.P.	..	35 KW.	..	Lg. 6	Flat rate	..		346
Nernst	10 H.P.	..	354 KW.	20	Lg. 6; pb. lg. 4; pr. 2	Flat rate	60,021	Gas power	347
..	14=29 H.P.	..	494 KW.	17	Lg. 5 less 5%; pr. 2½ & 3	Flat rate	158,193	Supply from the B.T.-H. Co.'s works at 2,300 volts. Data to Mar., 1908	348
..	..	..	167 KW.	..	Lg. 4 & fixed charge, small houses 5	Hopkinson	40,098	Gas power	349
bn.	44=70 H.P.	..	615 KW.	14	Lg. 7 & 4, or 6; pr. 4 & 1½, or 2½	Max. demand & flat rate	156,352	Gas power. *Assist. eng., H. Groome. Data to Dec., 1907	350
rc, 8 cbn.	61 H.P.	..	281 KW.	96	Lg. 5; pb. lg. 3 to 1½; pr. 3	Flat rate	59,550	*Res dent eng. B. G. Drummond. Data for 1906-7	351
rc, 25 cbn., ntl., 178 N.	30=56 H.P.	80=2,000 H.P.*	1,317.5 KW.	24	Lg. 7 & 2, or 5½; pb. lg. & pr. 2½; tr. 2 to 1½	Max. demand & flat rate with dis.	751,023	Lighting & traction. *Energy sold to Tramway Co., 200 KW. max. demand. Data to Mar. 31, 1908	352
	9=4½ H.P.	..	71 KW.	..	Lg. 5; pr. 2	Flat rate	20,749	Suction gas plant substituted for steam 1904	353
Nernst	218=1,478 H.P.	See other Table	2,759 KW.	12	Lg. 4½ & 3½; pb. lg. 0·77; pr. 2 & 1 w. dis.; tr. 1.11 & 0.37	Lg. flat r., pr. max. dem. w. dis., tr. scale	2,896,726	Lighting and traction. Data to Mar. 31, 1908	354
e, 5 cbn., 30 mtl.	5=12 H.P.	..	307 KW.	18	Lg. 5½ & 3, or 5; pb. lg. 2; pr. 3 & 1·4, or 2 with lg.	Max. demand & flat rate	68,800	Data to Mar. 31, 1908	355
arc	907=9,230 H.P.	452=13,700 H.P.	22,925 KW.	6	Lg. 3½*; pb. lg. 1.25; pr. 1½ to 1; tr. 1.3	Flat rate, sl. scale & contract	14,229,148	Lighting and traction. *Or 1s. per 8-C.P. per qr. & 1½d. per unit. Data to Mar. 31, 1908	356
inc., 14 Nernst	57=148½ H.P.	..	1,119 KW.	6	Lg. 7, 4 & 2; pr. 4 & 1, or 2½	Max. demand, pr. flat rate	496,119	Part water power. Data to Dec. 31, 1907	357
..	10=20 H.P.	..	327 KW.	27.6	Lg. 6 to 4½; pr. 2½ to 1½	Sliding scale	66,284	Part gas power. Data to Sept. 30, 1907	358
..	234 H.P.	44=1,540 H.P.	3,317 KW.	3.3	Lg. 6 to 3; pr. 2; htg. 1; tr. 1.3	Sliding scale with discounts	798,425	Lighting and traction. Data to Dec. 31, 1907	359
, 321 cbn., Nernst	37=35 H.P.	..	616 KW.	9	Lg. 7 & 4, or 6; pr. 4 & 1½, or 2½	Max. demand & flat rate	284,851	*L. Gillett, assistant eng. Data to Dec. 1907	360
..	161 H.P.	280 H.P.	712 KW.	29.5	Lg. 7 & 2½; pr. 4½ & 1½; tr. 2	Max. demand & flat rate	260,001	Lighting and traction. *Tr. 500 v. Data to Dec. 31, 1907	361
rc	1,037=2,674 H.P.	..	18,005.5 KW.	21.4	Lg. 4; pr. 2 to 1 (dis. to 0.6); htg. 1.	Flat rate with discounts	8,200,748	Data approx. to Mar. 25, 1908	362
..	..	..	..	..	Lg. 5½ to 4; pr. 2½ to 2½	Scale	..		363
arc, 1 rnst arc, 220 & cbn. , 104 cbn., tl., 6 N. ntl.	89=680 H.P.	948* KW.	1,083 KW.	..	Lg. 4½ & 2; pb. lg. 1½; pr. 2 & 1, or 1½; tr. 1⅔	Max. demand & flat rate	824,027	Lighting and traction. *Tramway max. demand	364
	150 H.P.	..	883 KW.	10	Lg. 6, 4 & 2, or 5; pb. lg. about 2½; pr. 3, 2 to 1½, w. dis. to 10%	Flat rate & max. demand	486,885 (Mar 31, '07)	*Estimated	365
	10=34 H.P.	..	150 KW.	..	Lg. 5; pb. lg. arc £12½, glow £2 p.a.; pr. 3	Max. demand & flat rate	68,187	Data to Mar. 31, 1908	366
	27	..	447 KW.	17.1	Lg. 4, 4½, 6; pb. lg. 3; pr. 3	Flat rate with discount	250,248	Bulk supply to Windsor E. I. Co. at 3.94d. per unit. Data to Mar. 1908	367
	..	140=4,620 H.P.	3,518 KW.	..	Lg. 7 & 2½; pr. 1⅔	Max. demand & flat rate	..	Lg. & tr. Tramway Committee holds E. L. prov. order for Smethwick area	368
, 66 inc., Nernst	40=200 H.P.	50=1,250 H.P.	2,965 KW.	..	Lg. 4½; pb. lg. 2½; pr. 3 & 2; tr. 2¼	Flat rate	..	Lighting and traction	369
, 74 cbn., , 115 N.	..	See other Table	2,855 KW. (ex tr.)	11	Lg. 6 & 3, or 4½*; pb. lg. arc £13 14s., N. £2 14s. 9d.; pr. 2; tr. 1⅝	Max. demand, flat rate & Hopkinson	1,650,000	Lighting and traction. *Also £6 10s. per KW., and 1½d. p.u. Data to Mar. 31, 1908	370
, 150 inc.	56=375 H.P.	40=1,620 H.P.	5,098 KW.	..	Lg. 6, 4, & 2, or 4½; pb. lg. arc £20 p.a.; pr. 2 & 1½; tr. 1½ to 1⅓	Max. demand & flat rate	1,957,473	Lighting and traction	371
rc, 480×2 cbn. Nernst	1,000 H.P.	70=2,100 H.P.	2,984 KW. (ex. tr.)	5	Lg. 7 & 1½, or 4*; pr. 1⅛ to 1; htg. 2; tr. 1.5 to 1.3	Max. dem., flat & sl. scale, w. dis.	954,990	*Pb. lg. arc (w. 4, 16-C.P.) £22½; inc. (2 16-C.P.) £2 12s., p.a. Data o Mar. 31, 1908	372
	129 H.P.	..	434 KW.	..	Lg. 4; pr. 2½ to 1½	Sliding scale & flat rate	..		373
e	56 H.P.	..	743 KW.	..	Lg. 7 & 3, or 4½ to 5; pr. 2½ to 1½	Max. demand & flat rate w. discount	307,821	Data for 1907-8	374
..	200=4,000 H.P.	120=3,600 H.P.	4,000 KW.	..	Lg. 3½, less 10 %, or 4 & 2; pr. 2½ to ½; tr. 1	Max. dem., flat, sl. sc. & cont. w. dis.	8,000,000	Lighting & traction. Data to May 1, 1908	375
10 cbn.	88=496 H.P.	..	1,020 KW.	4	Lg. 7 & 3, or 5*; pb. lg. £70 p.a.; pr. 4 & 1, or 2½ & special	Max. dem., flat, 2-rate mr. & cont.	282,313	*Free wiring 6d. per lp. per qr. Wiring on hire purch. 3, 5, or 7 yrs. Data to Dec. 31, 1907	376
e, 96 cbn., tl., 65 N.	68=220 H.P.	..	725 KW.	10	Lg. 7 & 2, or 6 to 4½; pb. lg. 3·6; pr. 5 & 1, or 4 to 1½	Max. demand and sliding scale	317,821	Data to May 15, 1908	377
e, 2 inc., rnst rc	73=428 H.P.	90=3,150 H.P.	4,472 KW.	..	Lg. 4; pb. lg. arc £11½ p.a.; pr. 1½*; tr. 1½	Flat rate	1,319,000	Lighting & traction. *Special rates to large consumers	378
..	104=760 H.P.	..	1,581 KW.	18.5	Lg. 6 & 2, or 4; pb. lg. 2.83; pr. 2 to 1½	Max. demand, flat rate & 2-rate mtr.	734,444	Data to Mar. 31, 1908	379
..	622 H.P.	..	561 KW.	40	Lg. 7 & 2; pr. 1½ to 0·8	Max. dem., flat, sl. sc. & cont. w. dis.	374,091	Data to Mar. 31, 1908	380
..	24=37 H.P.	..	94.5 KW.	..	Lg. 8 & 6; pr. 6 to 3	Flat rate	25,547	Gas power	381
..	12=102 H.P.	..	160 KW. (May 30, '08)	..	Lg. 5; pr. 2½, 2, 1½; htg. 1½	Flat rate	*	*Works opened April 27, 1907; accounts made up to June 30	382
c, 76 mtl.	44=201 H.P.	See other Table	694 KW.	40.4	Lg. 4½, or £7 per KW. p.a. & 1½ p.u.*; pr. 3 to 1†; tr. 1.259	Flat rate, sl. sc. & Hopkinson	1,679,186	Lg. and tr. *Pb. lg. arc £20 (½ nt. £12) p.a., inc. 2½d. p.u. †Or £1 per H.P. per qr. & ½d. p.u. Data to Mar. 31, 1908	383
rc, 24 inc., Nernst	947=8,526 H.P.	198=3,385 H.P.	12,310.5 KW.	..	Lg. 4½ w. dis. to 2½, or 4½ & 2½ m.d.; * pr. 2½ to ⅝; tr. 1½	Max. demand and flat rate	6,259,954	Lg. & tr., 2 stations. Data for 1906. *Pb. lg. arc £13.18.8 p.a.	384
rnst	18=30½ H.P.	..	902 KW.	24	Lg. 7 & 3, or 6; pb. lg. £3½ per lp. p.a.; pr. 4 & 1½, or 2½	Max. demand and flat rate	220,337	*Worked by Callender's Cable and Construction Co., Ltd. Data to Dec. 31, 1907	385
198 mtl., Nernst	11=108 H.P.	250 KW.	1,309 KW.	59	Lg. 7 & 2, or 5; pr. 4½ & 1½, or 2½†	Max. demand & flat rate	482,890	*G. R. Hulme (Gen. Man.). †Pb. lg. arc £17½ (½ nt.), inc. & Nernst £3½ p.a. Data to Dec. 31, 1907	386
arc, 149 , 54 mtl.	25=76 KW.	..	865 KW.	12.0	Lg. 5½ to 4; pb. lg. 1.29 pr. 2 to 1	Sliding scale	347,820	Data to Mar., 1908	387
arc, 80 mtl.	1,536 H.P.	..	3,294 KW.	14.6	Lg. 6 & 2, or 4½; pb. lg. arc £25 & £11 p.a.; pr. 2 & 1½; tr. 1½ to 1	Max. demand and flat rate	1,909,856 (Mar. 1907)	Lighting and traction. Data to Mar., 1908	388
arc, 173 12×2 mtl.	243 H.P.	24=858 H.P.	1,912 KW.	..	Lg. 4, or £6 per KW. & 2 p.u.; pb. lg. 2.36 av.; pr. 2 w. dis.; tr. 1⅔	Flat rate & Hopkinson	887,488	Lighting & traction	389
e, 392 mtl.	98=278 H.P.	12=240 H.P.	1,456 KW.	4.6	Lg. 6 & 2; pr. 2; tr. 2 to 1	Max. demand and flat rate	625,288	Lighting and traction. *Purchased from Co. in 1893. Data to Mar. 31, 1908	390
Nernst	..	..	68 KW.	..	Lg. 4½; pr. 2½ to 1½	Flat rate	..		391
..	31=55 KW.	..	243 KW.	27.6	Lg. 4½*, or 6 & 2; pr. 2	Max. demand & flat rate	89,097	*Price raised from Jan. 1, 1908 (formerly 3d. per unit). Data to Mar. 31, 1908	392
arc, 63 st, 4 mtl.	12=41 H.P.	..	291 KW.	..	Lg. 6; pb. lg. average 2.71; pr. 3 & 2	Flat rate	129,933 (estd.)		393
nc.	..	..	..	..	Lg. 6; pb. lg. £2/4/0 per lamp per annum	Flat rate	..	Evanstown supplied for Ogmore Council; 43 street lights and private supply	394
tl.	7=14 H.P.	..	68 KW.	34	Lg. 5; pr. 3½	Flat rate and contract	18,146		395
,307 inc., Nernst	6=15 H.P.	..	831.5 KW.	..	Lg. 7 & 3; pb. lg. arc £20, inc. £2½ p.a.; pr. 2½	Max. demand and flat rate	..		396
..	4=7 H.P.	..	89 KW.	33	Lg. 4½; pr. 3	Flat rate	23,418	*Resident eng. E. Silk. Data for 1906-7	397
..	..	..	..	..	Lg. 4 & 1½; pr. 1½ & ½	Max. demand	3,601,785	Bulk supply to Sale U.D.C. *Extension of 1,000 KW. in progress. Data to Mar. 31, 1908	398
rc	..	..	..	..	..	..	..	Electricity supplied by Rother Vale Collieries, Ltd.	399
arc, 157 69 mtl.	39=82 H.P.	..	2,187.5 KW.	3.2	Lg. 6 & 3, or 4½; pb. lg. 1.93; pr. 2½ to 1½	Max. demand, flat rate & 2 rate mtr.	899,733	Data to Mar. 1908	

												(491 KW.)		
381	STOWMARKET	Suffolk Electricity Supply Co.,	1906	Napier Prentice*	100	Direct	78	39	13.5 KW.	..	2,500 (83 KW.)	..	24=37 H.P.
382	STRATFORD-ON-AVON	Stratford-on-Avon Electricity Co., Ltd.	1907 (April)	Cecil D. Falcke	220 & 440	Direct	100	47	47 KW.	£8,400	2,640 (88 KW.)	..	12=102 H.P.
383	STRETFORD	Stretford Urban District Council	1903	R. Rowland	220 & 440, tr. 550	Direct	1,500	1,004	200 KW.	£60,000	14,476 (482·5 KW.)	98 arc, 76 mtl.	44=201 H.P.
384	SUNDERLAND	Sunderland Corporation	1895	A. S. Blackman	220 D.C. 240 A.C.	Direct & 50~, 3-ph.	5,530	3,746	About 320 KW.	£326,494	91,809 (3,060 KW.)	173 arc, 24 inc., 24 Nernst	947=8,526 H.P.
385	SURBITON	Surbiton Urban District Council*	1903	H. MacDonald Gill (resident)	240 & 480	Direct	380	197	90 KW.	£52,026	26,037 (869 KW.)	2 Nernst ..	18=30½ H.P.
386	SUTTON, CARSHALTON WALLINGTN & CHEAM	South Metropolitan Electric Tramways & Lighting Co.	1902	C. W. Durnford (Chf. Eng.)*	200 A.C., tr. 500 D.C.	50~, 1-ph., & direct	1,500	560	..	£80,538	32,141 (964 KW.)	2 arc, 193 mtl., 2 Nernst	11=108 H.P.
387	SUTTON COLDFIELD	Sutton Coldfield Corporation	1901	T. Duesbury	230 & 460	Direct	625	241	90 KW.	£41,309	20,559 (685 KW.)	14 arc, 149 cbn., 54 mtl.	25=76 KW.
388	SWANSEA	Swansea Corporation..	1901	C. A. L. Prusmann	220 & 440 tr. 550	Direct and 50~, 1-ph.	2,325	918 (ex. tr.)	78 KW.	£136,903	2,156 KW.	74 arc, 80 mtl.	1,536 H.P.
389	SWINDON	Swindon Corporation..	1903	A. Dimmack	220 & 440 tr. 500	Direct	900	665	350 A.H.	approx. £53,929	23,231 (774 KW.)	21 arc, 173 cbn., 12×2 mtl.	243 H.P.
390	TAUNTON	Taunton Corporation..	1888*	E. B. Thornhill	105 & 210 tr. 560 D.C.	60~, 1-ph., & direct	1,100	564	..	£70,111	27,889 (930 KW.)	72 arc, 292 mtl.	98=278 H.P.
391	THIRSK AND SOWERBY	Northern Counties Electricity Supply Co., Ltd.	1903	C. W. Fairweather	230 & 460	Direct	95	30	..	£9,133	1,602 (53·5 KW.)	186 Nernst	..
392	TODMORDEN	Todmorden Corporation	1905	Henry Talbot	230	Direct	225	103	13.8 KW.	£20,000	5,650 (188 KW.)	..	31=55 KW.
393	TONBRIDGE	Tonbridge Urban District Council	1902	M. P. Plunkett	220	Direct	120	94	150 KW.	£23,421	6,364 (212 KW.)	18 arc, 63 Nernst, 4 mtl.	12=41 H.P.
394	TONYREFAIL AND GILFACH COCH	Tonyrefail & Gilfach Goch El. Light & Power Co. Ltd.	1904	Arthur J. Arthur	220	50~, 1-ph.	75	70	..	£5,000	1,200 (40 KW.)	204 inc. ..	..
395	TOPSHAM	Topsham Electricity Supply Co., Ltd.	1905	H. C. Gould	100	Direct	7	18.5	14 KW.	£1,874	1,392 (46.5 KW.)	66 mtl.	7=14 H.P.
396	TORQUAY	Torquay Corporation..	1898	P. Storey	200	50~, 1-ph.	625	318	..	£46,940	22,890 (763 KW.)	53 arc, 307 inc., 150 Nernst	6=15 H.P.
397	TOTNES	Totnes Electricity Supply Co., Ltd.	1904	K. A. Scott-Moncrieff*	225 & 450	Direct	66	34.5	35 KW.	£12,600	2,452 (81.7 KW.)	..	4=7 H.P.
398	TRAFFORD PARK & SALE	Trafford Power & Light Supply (1902) Ltd.	1899	J. J. McGregor	250 & 500 D.C. 3,000 A.C.	Direct & 30~, 3-ph.	3,100*	2,548	..	£156,500	..	..	..
399	TREETON	Treeton Parish Council	1897	W. H. Barwell	1,250	Direct	15	..	..	..	..	25 arc	..
400	TUNBRIDGE WELLS	Tunbridge Wells Corporation	1895	H. Boot (Cons.) D. Smith (Res. Eg.)	220	67.5~, 1-ph.	1,200	682	..	£81,826	58,530 (1,951 KW.)	79 arc, 157 cbn., 69 mtl.	39=82 H.P.
401	TWICKENHAM, HAMPTON & TEDDINGTON	Twickenham & Teddington Electric Supply Co., Ltd.	1902	C. E. Hume	240 & 480	Direct	810	617	85 KW.	£215,023	70,572 (2,352 KW.)	..	52=232 H.P.
402	TYNEMOUTH	Tynemouth Corporation	1901	C. Turnbull	220 & 440 tr. 550	Direct	1,070*	1,040	110 KW.	£90,404	33,223 (1,107.4 KW.)	24 arc, 8 cbn., 35 mtl., 89 N.	119=1,493 H.P.
403	UXBRIDGE AND DIST.	Uxbridge & District Electric Supply Co., Ltd.	1902	A. Randall Bell	200	50~, 1-ph.	1,040	630	..	£77,973	24,168 (805 KW.)	1 arc, 54 mtl.	15=370 H.P.
404	VENTNOR, BONCHURCH AND ST. LAWRENCE	Isle of Wight Electric Light and Power Co., Ltd.	1899	A. E. Mayes (Man.) C. Grut (Asst.)	210	Direct	385	191	100 KW.	£56,794	16,355 (545 KW.)	24 arc, 115 cbn., 35 Nernst	33=65 H.P.
405	WAKEFIELD	Wakefield Corporation	1898	H. A. Nevill	200	60~, 2-ph.	1,562	1,071	..	£77,436	..	64 arc, 43 cbn., 50 mtl.	133=964 H.P.
406	WALLASEY	Wallasey Urban District Council	1897	J. A. Crowther	100 & 200 A.C. 500 D.C.	50~, 1-ph., & direct	2,550	1,228	..	£93,561	58,356 (1,945 KW.)	60 arc, 120 inc.	51=294 H.P.
407	WALSALL	Walsall Corporation	1895	A. S. Barnard	105 & 210 tr. 500	Direct	1,730	980	..	£104,770	34,210 (1,140 KW.)	19 arc, 10 mtl., 12 Nernst	380 KW.
408	WALTHAMSTOW	Walthamstow Urban District Council	1901	G. R. Spurr	230 & 460	Direct	1,900	726	250 KW.	£132,000	39,737 (1324.6 KW.)	89 arc, 460 inc., 8 Nernst	393 H.P.
409	WALTON-ON-NAZE	Coast Development Corporation	1903	E. A. Lambert	230	Direct	100	90	65 KW.	..	4,350 (145 KW.)	1 arc, 100 Nernst	..
410	WALTON-ON-THAMES	Urban Electric Supply Co., Ltd.	1904	Herbert W. Watts	240 & 480	Direct	105	102	175 KW.	£44,327	15,968 (532 KW.)	50 Nernst	7=7 H.P.
411	WARRINGTON	Warrington Corporation	1900	F. V. L. Mathias	230 & 460 D 220 & 380 A	Direct & 50~, 3-ph.*	2,150	1,801	800 A.H.	£90,000	2,597 KW. (inc. mtrs.)	32 arc, 53 cbn.	..
412	WATFORD	Watford Urban District Council	1899	F. W. Purse	200	50~, 1-ph.	1,130	633	56 KW. for 2 h.	£85,331	33,330 (1,111 KW.)	16 arc, 1,890 cbn., 43 mtl.	107=485 H.P.
413	WEDNESBURY	Wednesbury Corporation	1904	W. Fennel	200 A.C., 230 D.C.	50~, 2-ph., & direct	150*	100 (Wed'sb'y)	75 KW. for 3 h.	£13,500 (approx.)	7,098 (236.6 KW.)	..	8=65½ H.P.
414	WELLINGBOROUCH	County of Northampton El. Power & Traction Co., Ltd.	1903	Wm. J. S. Jones	230 & 460	Direct	300	160	70 KW.	..	4,871 (162 KW.)	261 inc., 6 Nernst	16=96 H.P.
415	WEST BROMWICH	West Bromwich Corporation	1901	W. A. Jackson	230 & 460 tr. 500	Direct	1,550	1,000	350 KW.	£71,041	21,370 (700 KW.)	81 arc, 80 cbn., 4 mtl.	117=920 H.P.
416	WEST HAM	West Ham Corporation	1899	A. Hugh Seabrook	100, 200 & 400 A.C.*	50~, 1 & 2-ph., & direct	8,400	5,500	400 KW.	£420,000 (approx.)	3,3.6 KW.	361 arc, 18 cbn., 233 mtl.	445=6,224 H.P.
417	WEST HARTLEPOOL	West Hartlepool Corporation	1901	H. F. Friederichs	230 & 460	Direct	1,600	948	69 KW.	£94,613	53,053 (1,768 KW.)	39 arc ..	195=1,599 H.P.
418	WESTON-SUPER-MARE	Weston-super-Mare & District Electric Supply Co., Ltd.	1901	G. Charlton	230 & 460	Direct	1,100	450	100 KW.	..	20,197 (673 KW.)	..	13=89½ H.P.
419	WEYBRIDGE	Urban Electric Supply Co., Ltd.	1902	Herbert W. Watts	240 & 480	Direct	580	374	45 KW.	£72,774	23,543 (785 KW.)	..	34=73 H.P.
420	WEYMOUTH	Weymouth Corporation	1904	J. H. Bolam	230 & 460	Direct	394	302	130 KW.	£47,000	18,684 (623 KW.)	48 arc, 96 cbn., 548 mtl.*	36=147.5 H.P. (Htg. 47 KW)
421	WHITBY	Whitby Urban District Council	1902	L. H. King	230 & 460	Direct	400	133	23 KW.	£38,400	11,125 (371 KW.)	31 arc, 314 inc., 121 Nernst	23=102 H.P.
422	WHITCHURCH AND PANGBOURNE	Whitchurch and Pangbourne Electric Supply Co., Ltd.	1908	D. H. Coombs	240 & 480	Direct	108	80	30 KW.	£6,050	2,993 (100 KW.)	..	1=6½ H.P.
423	WHITEHAVEN	Whitehaven Corporation	1893	B. Sankey	210, 420, & 440	Direct	386	230	105 KW.	£43,467	Abt. 15,000 (500 KW.)	9 arc, 500 inc.	28=136 H.P.
424	WIGAN	Wigan Corporation	1900	J. Slevin	230 & 460 tr. 550	Direct	1,960	1,805	675 A.H.	£131,780	38,731 (1,291 KW.)	22 arc, 12 inc., 3 N., 6 mtl.	210=1,721 H.P.
425	WILLESDEN	Willesden Urban District Council	1903	J. G. Bruce	240 & 480	Direct	900	1,358	97 KW.	£181,605	77,345 (2,578 KW.)	206 arc, 200 inc.	722 H.P.
426	WIMBLEDON & MERTON	Wimbledon Corporation	1899	H. Tomlinson Lee	220	50~, 1-ph.	2,685	1,548	..	£184,029	123,278 (4,109 KW.)	141 arc, 1,088 cbn.	67=654½ H.P.
427	WINCHESTER	Winchester Electric Light & Power Co., Ltd.	1898	H. N. Warburton	210 & 420	Direct	950	385	85 KW.	£88,239	47,993 (1,600 KW.)	..	64=102 H.P.
428	WINDERMERE AND AMBLESIDE	Windermere & District Electricity Supply Co., Ltd.	1893	C. Walker (Man.)	100 & 200	100~, 1-ph.	225	134	..	£41,670	14,500 (483 KW.)	127 cbn. ..	13=19 H.P.
429	WINDSOR & ETON	Windsor Electrical Installation Co., Ltd.	1896	A. E. Farrow	110 & 220	Direct & 50~, 1-ph.	530 D.C., 100 A.C.*	645*	130 KW.	£83,954	38,673 (1,289 KW.)	31 arc, 284×2 mtl.	60=106 KW.
430	WISHAW	Wishaw Corporation	1905	Ernest F. Cox	240 & 480	Direct	200	163	..	£20,000	..	48 arc, 108 mtl., 7 Nernst	38=100 H.P.
431	WITNEY	Witney Electric Supply Co., Ltd.	1900	F. G. Curel	220	Direct	100	70	15.4 KW.	£9,825	3,700 (123 KW.)	..	5=16 H.P.
432	WOKING	Woking Electric Supply Co., Ltd.	1890	J. G. McLean	200	100~, 1-ph.	1,175	477	..	£97,771	39,778 (1,326 KW.)	..	4=7 H.P.
433	WOLVERHAMPTON	Wolverhampton Corporation	1895	C. E. C. Shawfield	220 & 440 tr. 500	Direct	3,230	2,075	385 KW. & 350 KW.	£197,128	68,256 (2,275 KW.)	56 arc, 45 cbn., 55 mtl., 110 N.	1,559 H.P.
434	WORCESTER	Worcester Corporation	1894	C. M. Shaw	100, 200 A.C. 230, 460 D.C.	100~, 1-ph., & direct	1,725	798	150 KW.	£128,979	45,909 (1,530 KW.)	58 arc, 85×2 inc.	33=188 H.P.
435	WORKSOP	Worksop Urban District Council	1901	J. Percival Crowther	220 & 440	Direct	540	266	92 KW.	£27,822	15,538 (518 KW.)	35 arc, 136 cbn.	32=156 H.P.
436	WORMIT	Tayside Electric & Gas Light Co., Ltd.	1898	E. A. Stewart	230	Direct	40	..	..	..	1,500 (50 KW.)	..	..
437	WORTHING	Worthing Corporation	1901	G. Porter	230 & 460	Direct	538	292	69 KW.	£50,000	21,965 (732 KW.)	115 arc, 22 inc., 9 Nernst	24=50 H.P.
438	WREXHAM	Wrexham Corporation	1901	W. G. Pickvance	230 & 460 tr. 500	Direct	735	360 lg., 200 tr.	..	£37,975	..	41 arc, 190 mtl., 23 Nernst	29=105 H.P.
439	YARMOUTH	Yarmouth Corporation	1895	G. Bryant	100 & 200 tr. 500	83~, 1-ph.	735	382	..	£95,000	44,052 (902 KW.)	181 arc, 100 mtl.	38=70 H.P.
440	YORK	York Corporation	1900	J. W. Hsme	230 & 460	Direct	1,860	976	400 KW.	£125,254	0.472 (2,016 KW.)	106 arc, 35 mtl.	155=1,028 H.P.

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..	622 H.P. ..	..	561 KW.	40	Lg. 7 & 2; pr. 1½ to 0·8	Max. dem., flat, sl. sc. & cont. w. dis.	874,091	Data to Mar. 31, 1908	380
..	24=37 H.P.	..	94.5 KW.	..	Lg. 8 & 6; pr. 6 to 3	Flat rate	25,547	Gas power	381
..	12=102 H.P.	..	160 KW. (May 30, '08)	..	Lg. 5; pr. 2½, 2, 1½; htg. 1½ ..	Flat rate	*	*Works opened April 27, 1907; accounts made up to June 30	382
rc, 76 mtl.	44=201 H.P.	See other Table	694 KW.	40.4	Lg. 4½, or £7 per KW. p.a. & 1½ p.u.*; pr. 3 to 1†; tr. 1.259	Flat rate, sl. sc. & Hopkinson	1,679,186	Lg. and tr. *Pb. lg. arc £20 (½ nt. £12) p.a., inc. 2½d. p.u. †Or £1 per H.P. per qr. & ½d. p.u. Data to Mar. 31, 1908	383
arc, 24 inc., 4 Nernst Nernst ..	947=8,526 H.P.	138=3,285 H.P.	12,310.5 KW.	..	Lg. 4½ w. dis. to 2½ or 4½ & 2½ m.d.; * pr. 2½ to ¾; tr. 1½	Max. demand and flat rate	6,259,954	Lg. & tr., 2 stations. Data for 1906. *Pb. lg. arc £13.18.8 p.a.	384
e, 193 mtl., Nernst arc, 149 , 54 mtl. arc, 80 mtl. arc, 173 ,12×2 mtl. rc, 292 mtl.	18=30½ H.P.	..	902 KW.	24	Lg. 7 & 3, or 6; pb. lg. £3½ per lp. p.a.; pr. 4 & 1½, or 2½	Max. demand and flat rate	220,337	*Worked by Callender's Cable and Construction Co., Ltd. Data to Dec. 31, 1907	385
	11=108 H.P.	250 KW.	1,809 KW.	59	Lg. 7 & 2, or 5; pr. 4½ & 1½, or 2½†	Max. demand & flat rate	482,890	*G. R. Hulme (Gen. Man.). †Pb. lg. arc £17½ (½ nt.), inc. & Nernst £3½ p.a. Data to Dec. 31, 1907	386
	25=76 KW.	..	865 KW.	12.0	Lg. 5½ to 4; pb. lg. 1.29 pr. 2 to 1	Sliding scale ..	347,820	Data to Mar., 1908	387
	1,536 H.P. ..	..	3,294 KW.	14.6	Lg. 6 & 2, or 4½; pb. lg. arc £25 & £11 p.a.; pr. 2 & 1½; tr. 1½ to 1	Max. demand and flat rate	1,909,856 (Mar. 1907)	Lighting and traction. Data to Mar., 1908	388
	243 H.P. ..	24=858 H.P.	1,912 KW.	..	Lg. 4, or £6 per KW. & 2 p.u.; pb. lg. 2.36 av.; pr. 2 w. dis.; tr. 1½	Flat rate & Hopkinson	887,488	Lighting & traction	389
	98=278 H.P.	12=240 H.P.	1,456 KW.	4.6	Lg. 6 & 2; pr. 3; tr. 2 to 1 ..	Max. demand and flat rate	625,288	Lighting and traction. *Purchased from Co. in 1893. Data to Mar. 31, 1908	390
6 Nernst	..	..	68 KW.	..	Lg. 4½; pr. 2½ to 1½	Flat rate	..	.. ..	391
..	31=55 KW.	..	243 KW.	27.6	Lg. 4½", or 6 & 2; pr. 2.. ..	Max. demand & flat rate	89,097	*Price raised from Jan. 1, 1908 (formerly 3d. per unit). Data to Mar. 31, 1908	392
arc, 63 nst, 4 mtl. inc. ..	12=41 H.P.	..	281 KW.	..	Lg. 6; pb. lg. average 2.71; pr. 3 & 2	Flat rate	129,933 (estd.)	.. ..	393
	..	..	..	..	Lg. 6; pb. lg. £2/4/0 per lamp per annum	Flat rate	..	Evanstown supplied for Ogmore Council; 43 street lights and private supply	394
mtl.	7=14 H.P. ..	..	68 KW.	34	Lg. 5; pr. 3½	Flat rate and contract	18,146	.. ..	395
rc, 307 inc., 0 Nernst	6=15 H.P. ..	..	831.5 KW.	..	Lg. 7 & 3; pb. lg. arc £20, inc. £2½ p.a.; pr. 2½	Max. demand and flat rate	..	.. ..	396
..	4=7 H.P. ..	..	89 KW.	33	Lg. 4½; pr. 3	Flat rate	23,418	*Resident eng. E. Silk. Data for 1906-7	397
..	..	..	..	..	Lg. 4 & 1½; pr. 1½ & ½	Max. demand ..	3,601,785	Bulk supply to Sale U.D.C. *Extension of 1,000 KW. in progress. Data to Mar. 31, 1908	398
arc ..	..	..	..	..	.. ..	..	..	Electricity supplied by Rother Vale Collieries, Ltd. ..	399
arc, 157 , 69 mtl.	39=82 H.P.	..	2,137.5 KW.	3.2	Lg. 6 & 3, or 4½; pb. lg. 1.93; pr. 2½ to 1¾	Max. demand, flat rate & 2 rate mtr.	899,733	Data to Mar. 1908	400
..	52=232 H.P.	..	2,525 KW.	18.5	Lg. 7 & 3, or 5½ w. free lamps; pr. 4 & 1½, or 2½	Max. demand, flat rate, & 2-rate meter	784,017	*Also S. Margarets o/T., Hampton Wick, Hampton Ct. and E. Molesey	401
arc, 8 cbn., ntl., 89 N. c, 54 mtl.	119=1,493 H.P.	27 cars ..	2,486 KW. (ex. tr.)	14.8	Lg. 5 & 2 or 4½†; pr. 2½ & 1½, or 1½ & spl.; tr. 1½ to 1 (T side, 1½)	Max. demand and flat rate	1,454,036	Lg. & tr. *Bulk supply, 1,000 KW., from Carville. †Pb. lg., arc £16 & £13; N. £2, p.a. Data to Mar. 25, 1908	402
	15=370 H.P.	..	1,150 KW.	12.9	Lg. 7 (rural), 5 (urban); pb. lg. £2/5/6 per lp. p.a.; pr. 3 & ¾, or 2½	Max. demand and flat rate	507,100	Data to Dec. 1907	403
c, 115 cbn., 5 Nernst rc, 43 cbn., 50 mtl.	33=65 H.P.	..	688.5 KW.	5.5	Lg. 7 & 4, or 6; pr. 4 & 1½, or 2½	Max. demand, flat rate & contract	233,837	Data to Dec., 1907	404
	133=964 H.P.	..	2,148 KW.	..	Lg. 4 (ch. 3); pb. lg. arc £13½, inc. £2 p.a.; pr. 1½ to 1 (hoists, 2)	Flat rate	1,125,279	Data to Mar. 31, 1908	405
rc, 120 inc.	51=294 H.P.	See other Table	2,190 KW.	11.1	Lg. 4 to 3; pb. lg. arc £20 p.a.; pr. 2; tr. 1¾	Sliding scale and flat rate	1,949,126	Lighting and traction	406
rc, 10 mtl., 2 Nernst	380 KW. ..	448 KW. ..	2,167 KW.	10.3	Lg. 6 to 2, or 4; pb. lg. arc £488, inc. £2½, N. £4½ p.a.; pr. 2 to 1½; tr. 1½	Max. demand and flat rate w. dis.	1,454,521	Lighting and traction. Data to Dec. 31, 1907	407
rc, 460 inc., Nernst rc, 00 Nernst Nernst	300 KW. ..	See other Table 1=15 H.P.	1,743 KW. (ex. tr.) 157.5 KW.	.. 39	Lg. 4 w. dis.; pb. lg. 3 & 2; pr. 1½ to 2½ Lg. 6; pb. lg. arc £12, Nernst £2/17/6 p.a.	Flat rate .. .. Flat rate	.. 49,500	Lighting and traction. Gas power.. .. .. .. Lighting & traction	408 409
	7=7 H.P. ..	..	557 KW.	..	Lg. 7 & 3, or 5½; pr. 4 & 1½, or 2½	Max. demand and flat rate	139,993	Energy transmitted from Weybridge to Walton at 2,500 v. D.C.	410
rc, 53 cbn.	..	42=798 H.P.	2,597 KW. (ex. tr.)	20.3	Lg. 6 & 2, or 4 (ch. 3½); pb. lg. £620 p.a.; pr. 2 & 1; tr. 1½. No mtr. rent	Max. dem., flat w. dis., pr. sl. scale	2,625,565	Lg. and tr. *220 volts 1-ph., 380 v. 3-ph.; tr. 500 v. D.C. Data to Mar. 31, 1908	411
arc, 1,890 ., 43 mtl.	107=485 H.P.	..	1,552 KW.	..	Lg. 7 & 3, or 5; pb. lg. 3; pr. 2 to 1	Max. demand, flat rate & sl. scale	923,808	Data to Mar. 31, 1908	412
..	8=65½ H.P.	..	320 KW.	..	Lg. 6 & 2, or 4 (W.), 3½ (K.H.), pr. 3 to 1½ (W.), 1½ to ¾ (K.H.*)	Max. demand, flat rate & 2-rate meter	105,000	*Bulk supply from Midland Corp., converted to D.C. for Wednesbury, A.C. King's Hill	413
inc., 6 Nernst	16=96 H.P.	..	270 KW.	..	Lg. 7 & 2½; pb. lg. 2½; pr. 4½ & 1½	Max. demand ..	195,000	.. ..	414
rc, 80 cbn., 4 mtl.	117=920 H.P.	30=900 H.P.	2,000 KW.	5	Lg. 4½ & 1½, or 3½; pb. lg. 0.86*; pr. 1½ to 0.8; tr. 2 to 1½	Max. demand, flat rate, sl. sc., & cont.	1,824,887	Lg. & tr. *Pb. lg. £15 p.a., two arcs dusk to 11 p.m., 2 25-C.P. inc. 11 to dawn. Data to Mar. 31, 1908	415
arc, 18 cbn., 33 mtl.	445=6,224 H.P.	200=5,000 H.P.	11,873 KW.	11.36	Lg. 8; pb. lg. 1.4; pr. 1; tr. 1	Hopkinson and special contract	11,299,783	*Also 100, 220 and 500 D.C.; tr. 500. Data to Mar., 1908	416
arc ..	195=1,699 H.P.	..	3,474 KW.	..	Lg. 4 & 3, or 6 & 2 m.d.; pb. lg. 1½; pr. 2 to ⅔; ckg. 1	Max. dem. & flat rate; pr. sl. scale	1,810,424	Data to Mar. 31, 1908	417
..	13=89½ H.P.	24=480 H.P.	1,168 KW.	10.5	Lg. 7 & 2, or 5; pr. 4½ & 1½, or 2½; tr. 2	Max. demand and flat rate	391,521	Lighting and traction. Data to Dec. 31, 1907	418
..	34=73 H.P.	..	858 KW.	7	Lg. 7 & 3, or 5½ (slot m., 7 incl.); pr. 4 & 1½, or 2½	Max. demand and flat rate	496,836	Energy transmitted to Walton at 2,500 v. D.C. Data to Dec. 31, 1907	419
rc, 96 cbn., 48 mtl.*	36=147.5 H.P. (Htg. 47 KW)	..	797 KW.	18.2	Lg. 5; pb. lg. arc 3, Nernst 3½; pr. 2½; htg. 2½	Flat rate with discounts	353,415	*266 Posts. Data to Mar. 31, 1908..	420
rc, 314 inc., 1 Nernst	23=102 H.P.	..	480.5 KW.	..	Lg. 4½; pb. lg. 3; pr. 2, 1½ & 1	Max. dem., flat rate, 2-rate mtr. & cont.	225,309	.. ..	421
..	1=6½ H.P.	..	104 KW.	10.6	Lg. 8; pr. 2, 3 & 4	Flat rate and contract with dis.	25,300	Data to Dec. 31, 1907	422
rc, 500 inc.	28=126 H.P.	..	634.5 KW.	4.3	Lg. 4½*; pb. lg. 4; pr. 2 to 1, or 4½ & 1½ to 1 by 2-rate meter	Hopkinson, flat rate, sl. scale & 2-rate	282,280	*Or £8 per an. per KW. & 2d. per unit. Data to Mar. 31, 1907	423
rc, 12 inc., N., 6 mtl. 3 arc, 200 nc.	210=1,721 H.P. 722 H.P.	See other Table ..	2,629.5 KW. 3,226 KW.	.. 15	Lg. 5, 4, 3; pb. lg. 3; pr. 1; htg. 2; tr. 1½ Lg. 8 & 1, or 5; pb. lg. arc £13 4s.; pr. 1½ to 0.58	Flat rate .. .. Max. demand & flat rate	3,116,581 1,926,960	Lighting and traction .. .. Bulk supply from North Met. E. P. S. Co. Data to Mar. 31, 1908	424 425
arc, 1,088 bn.	67=654½ H.P.	..	4,793 KW.	15.1	Lg. 4½ to 3½; pb. lg. 2½; pr. 2 (above 2 H.P., 1½)	Sliding scale ..	2,345,958	Motors of 363 B.H.P. pumping sewage. Data to Mar. 31, 1908	426
..	64=102 H.P.	..	1,816 KW.	6.2	Lg. 7, 4, & 2; pr. 4 & 1½.. ..	Max. demand, flat rate & contract	496,067	Data to Dec. 31, 1907	427
cbn. ..	18=19 H.P.	..	493 KW.	..	Lg. 7; pb. lg. 3; pr. 3½.. ..	Flat rate	131,651	Data to Dec. 31, 1907	428
arc, 284×2 mtl.	60=106 KW.	..	1,439 KW.	7.4	Lg. 6 & 3, or 6 w. dis.; pr. £3 p.a. per H.P. & 1 p.u.; htg. 3 w. dis.†	Max.dem., flat rate w. dis., & Hopkinson	704,777	*Adtn'l b'lk s'ply from Slough & Datchet Co. †Pb. lg. arc £22, £16; twin tant. £4½ p.a. Data to Dec. 31, 1907	429
rc, 108 mtl., Nernst	38=200 H.P.	..	550 KW.	18	Lg. 4; pb. lg. 1½; pr. 1 to 4 ..	Flat rate	200,000	Max. load reduced owing to metallic filament lamps. Data to April 29, 1908	430
..	5=26 H.P.	..	150 KW.	..	Lg. 6 & 5; pr. 2½..	Flat rate	45,997	Gas power	431
..	4=7 H.P. ..	..	1,381 KW.	..	Lg. 6½; pr. 4 & 2; htg. 2 ..	Flat rate	524,878	Bulk supply at 2,000 volts to L. & S. W. Ry. Co. ..	432
rc, 45 cbn., ntl., 110 N. arc, 85×2 nc.	1,559 H.P. ..	See other Table	3,690 KW.	30	Lg. 5 & 2½; pb. lg. arc £20 p.a.*; pr. 3 & 1; tr. 1½	All methods ..	3,868,787	Lighting and traction. *Pb. lg., inc. £2 15s. per lp. p.a. Data for 1906-7	433
rc, 136 cbn.	33=188 H.P. 32=156 H.P.	24=300 H.P. ..	1,703.6 KW. 704.5 KW.	.. 27.9	Lg. 6½ & 3, or 4½ (shops 5); pr. 2½ & 1; tr. 2 to 1½ Lg. 4; pb. lg. 3½; pr. 1½ ..	Max. demand, flat rate & sl. scale Flat rate with discounts	1,128,173 329,071	Lighting and traction; old station A.C., new one D.C. Data to Dec. 31, 1906 Data to Mar. 31, 1908	434 435
..	..	..	50 KW.	..	Lg. 5	Flat rate	15,000	Converted from steam plant to suction-gas plant. Data to 1908	436
arc, 22 inc., 0 Nernst rc, 190 mtl., 3 Nernst 1 arc, 100 mtl.	24=80 H.P.	..	810 KW.	..	Lg. 6 w. dis.; pb. lg. 3.75; pr. 3 w. dis.	Flat rate with discounts	..	.. ..	437
	29=105 H.P.	20=500 H.P.	722 KW.	18	Lg. 5 w. dis.; pb. lg. arc £20, N. £4½ p.a.; pr. 2½ to 1; tr. 2½	Flat rate & sliding scale	445,683	Lighting and traction. Data to Mar. 31, 1908	438
	38=70 H.P...	..	..	..	Lg. 5, less 5%; pb. lg. arc, £16 p.a.; pr. 2½ A.C., 2 D.C.	Max. dem., flat rate w. dis., cont., t. sw.	1,513,937	Lighting and traction. Data to Mar. 31, 1908	439
arc, 35 mtl.	155=1,028 H.P.	..	2,585 KW.	13	Lg. 7 & 1½, or 4½ to 3½, ch. 3; pr. 1½ to 1*	Max. dem., flat, 2-rate meter, & contract	1,288,517	*Pb. lg. arc £17 (open), £12/12/0 per pair (enc.); Nernst £2⅜, p.a. Data to Mar. 31, 1908	440

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398	TRAFFORD PARK & SALE	Trafford Power & Light Supply (1902) Ltd.	1899	J. J. McGregor..	250 & 500 D.C. 3,000 A.C.	Direct & 30~, 3-ph.	3,100*	2,548	..	£156,500	..	..	..	
399	TREETON	Treeton Parish Council ..	1897	W. H. Barwell..	1,250	Direct ..	13	..	..	..	..	25 arc ..	..	
400	TUNBRIDGE WELLS ..	Tunbridge Wells Corporation	1895	H. Boot (Cons.) D. Smith (Res. Eg.)	220	67.5~, 1-ph.	1,200	682	..	£81,826	58,530 (1,951 KW.)	79 arc, 157 cbn., 69 mtl.	39=82 H.P.	
401	TWICKENHAM HAMPTON & TEDDINGTON*	Twickenham & Teddington Electric Supply Co., Ltd.	1902	C. E. Hume ..	240 & 480	Direct ..	810	617	85 KW.	£215,023	70,572 (2,352 KW.)	..	52=222 H.P.	
402	TYNEMOUTH	Tynemouth Corporation ..	1901	C. Turnbull ..	220 & 440 tr. 550	Direct ..	1,070*	1,040	110 KW.	£90,404	33,223 (1,107.4 KW.)	24 arc, 8 cbn., 35 mtl., 89 N.	119=1,493 H.P.	
403	UXBRIDGE AND DIST.	Uxbridge & District Electric Supply Co., Ltd.	1902	A. Randall Bell	200	50~, 1-ph.	1,040	830	..	£77,973	24,168 (805 KW.)	1 arc, 54 mtl.	15=870 H.P.	
404	VENTNOR, BONCHURCH AND ST. LAWRENCE	Isle of Wight Electric Light and Power Co., Ltd.	1899	A. E. Mayes (Man.) C. Grut (Asst.)..	210	Direct ..	335	191	100 KW.	£56,794	16,355 (545 KW.)	24 arc, 115 cbn., 35 Nernst	33=65 H.P.	
405	WAKEFIELD	Wakefield Corporation ..	1898	H. A. Nevill ..	200	60~, 2-ph.	1,562	1,071	..	£77,436	..	64 arc, 43 cbn., 50 mtl.	133=964 H.P.	
406	WALLASEY	Wallasey Urban District Council	1897	J. A. Crowther..	100 & 200 A.C. 500 D.C.	50~, 1-ph., & direct	2,550	1,228	..	£93,561	58,356 (1,945 KW.)	60 arc, 120 inc.	51=294 H.P.	
407	WALSALL	Walsall Corporation	1895	A. S. Barnard ..	105 & 210 tr. 500	Direct ..	1,730	980	..	£104,770	34,210 (1,140 KW.)	19 arc, 10 mtl., 12 Nernst	380 KW. ..	
408	WALTHAMSTOW ..	Walthamstow Urban District Council	1901	G. R. Spurr ..	230 & 460	Direct ..	1,900	726	250 KW.	£132,000	39,737 (1324.6 KW.)	89 arc, 460 inc., 8 Nernst	390 H.P. ..	
409	WALTON-ON-NAZE ..	Coast Development Corporation	1908	E. A. Lambert ..	230	Direct ..	100	90	65 KW.	..	4,350 (145 KW.)	1 arc,	..	
410	WALTON-ON-THAMES	Urban Electric Supply Co., Ltd.	1904	Herbert W. Watts	240 & 480	Direct ..	105	102	175 KW.	£44,827	15,958 (532 KW.)	100 Nernst 50 Nernst	7=7 H.P. ..	
411	WARRINGTON	Warrington Corporation ..	1900	F. V. L. Mathias	230 & 460 D 220 & 380 A	Direct & 50~, 3-ph.*	2,150	1,801	800 A.H.	£90,000	2,597 KW. (inc. mtrs.)	32 arc, 53 cbn.	..	
412	WATFORD	Watford Urban District Council	1899	F. W. Purse ..	200	50~, 1-ph.	1,130	633	56 KW. for 2 h.	£85,331	33,330 (1,111 KW.)	16 arc, 1,890 cbn., 43 mtl.	107=485 H.P.	
413	WEDNESBURY ..	Wednesbury Corporation ..	1904	W. Fennel	200 A.C., 230 D.C.	50~, 2-ph., & direct	150*	100 (Wed'sb'y)	75 KW. for 3 h.	£13,500 (approx.)	7,098 (236.6 KW.)	..	8=35½ H.P.	
414	WELLINGBOROUCH ..	County of Northampton El. Power & Traction Co., Ltd.	1903	Wm. J. S. Jones	230 & 460	Direct ..	300	160	70 KW.	..	4,871 (162 KW.)	261 inc., 6 Nernst	16=96 H.P.	
415	WEST BROMWICH ..	West Bromwich Corporation	1901	W. A. Jackson..	230 & 460 tr. 500	Direct ..	1,550	1,000	350 KW.	£71,041	21,370 (700 KW.)	81 arc, 80 cbn., 4 mtl.	117=920 H.P.	
416	WEST HAM	West Ham Corporation ..	1899	A. Hugh Seabrook	100, 200 & 400 A.C.*	50~, 1 & 2-ph., & direct	8,400	5,500	400 KW.	£420,000 (approx.)	3.3.6 KW.	361 arc, 18 cbn., 238 mtl.	445=6,224 H.P.	
417	WEST HARTLEPOOL ..	West Hartlepool Corporation	1901	H. F. Friederichs	230 & 460	Direct ..	1,600	988	69 KW.	£94,613	53,053 (1,768 KW.)	89 arc ..	195=1,599 H.P.	
418	WESTON-SUPER-MARE	Weston-super-Mare & District Electric Supply Co., Ltd.	1901	G. Charlton ..	230 & 460	Direct ..	1,100	450	100 KW.	..	20,197 (673 KW.)	..	13=89½ H.P.	
419	WEYBRIDGE	Urban Electric Supply Co., Ltd.	1902	Herbert W. Watts	240 & 480	Direct ..	580	374	45 KW.	£72,774	23,543 (785 KW.)	..	34=7½ H.P.	
420	WEYMOUTH	Weymouth Corporation ..	1904	J. H. Bolam ..	230 & 460	Direct ..	394	302	130 KW.	£47,000	18,684 (623 KW.)	48 arc, 96 cbn., 548 mtl.*	36=147.5 H.P. (H.g. 47 KW.)	
421	WHITBY	Whitby Urban District Council	1902	L. H. King ..	230 & 460	Direct ..	400	183	23 KW.	£38,400	11,125 (371 KW.)	31 arc, 314 inc., 121 Nernst	23=102 H.P.	
422	WHITCHURCH AND PANGBOURNE	Whitchurch and Pangbourne Electric Supply Co., Ltd.	1903	D. H. Coombs ..	240 & 480	Direct ..	108	30	30 KW.	£6,050	2,993 (100 KW.)	..	1=6½ H.P.	
423	WHITEHAVEN	Whitehaven Corporation ..	1893	B. Sankey ..	210, 420, & 440	Direct ..	386	230	105 KW.	£43,467	Abt. 15,000 (500 KW.)	9 arc, 500 inc.	28=126 H.P.	
424	WICAN	Wigan Corporation	1900	J. Slevin ..	230 & 460 tr. 550	Direct ..	1,960	1,805	675 A.H.	£131,780	38,731 (1,291 KW.)	22 arc, 12 inc., 3 N., 6 mtl.	210=1,721 H.P.	
425	WILLESDEN	Willesden Urban District Council	1903	J. G. Bruce ..	240 & 480	Direct ..	900	1,358	97 KW.	£181,605	77,345 (2,578 KW.)	206 arc, 200 inc.	722 H.P.	
426	WIMBLEDON & MERTON	Wimbledon Corporation ..	1899	H. Tomlinson Lee	220	50~, 1-ph.	2,685	1,548	..	£184,029	123,278 (4,109 KW.)	141 arc, 1,038 cbn.	67=654½ H.P.	
427	WINCHESTER	Winchester Electric Light & Power Co., Ltd.	1898	H. N. Warburton	210 & 420	Direct ..	850	385	85 KW.	£88,239	47,993 (1,600 KW.)	..	64=102 H.P.	
428	WINDERMERE AND AMBLESIDE	Windermere & District Electricity Supply Co., Ltd.	1893	C. Walker (Man.)	100 & 200	100~, 1-ph.	225	134	..	£41,670	14,500 (483 KW.)	127 cbn. ..	13=19 H.P.	
429	WINDSOR & ETON ..	Windsor Electrical Installation Co., Ltd.	1896	A. E. Farrow ..	110 & 220	Direct & 50~, 1-ph.	530 D.C., 100 A.C.*	645*	130 KW.	£83,954	38,673 (1,289 KW.)	31 arc, 284×2 mtl.	60=106 KW.	
430	WISHAW	Wishaw Corporation	1905	Ernest F. Cox ..	240 & 480	Direct ..	200	163	..	£20,000	..	48 arc, 108 mtl., 7 Nernst	38=100 H.P.	
431	WITNEY	Witney Electric Supply Co., Ltd.	1900	F. G. Curel ..	220	Direct ..	100	70	15.4 KW.	£9,825	3,700 (123 KW.)	..	5=16 H.P.	
432	WOKING	Woking Electric Supply Co., Ltd.	1890	J. G. McLean ..	200	100~, 1-ph.	1,175	477	..	£97,771	39,778 (1,326 KW.)	..	4=7 H.P. ..	
433	WOLVERHAMPTON ..	Wolverhampton Corporation	1895	C. E. C. Shawfield	220 & 440 tr. 500	Direct ..	3,280	2,075	385 KW. & 350 KW.	£197,128	68,256 (2,275 KW.)	56 arc, 45 cbn., 55 mtl., 110 N.	1,559 H.P. ..	
434	WORCESTER	Worcester Corporation ..	1894	C. M. Shaw ..	100, 200 A.C. 230, 460 D.C.	100~, 1-ph., & direct	1,725	798	150 KW.	£128,979	45,909 (1,530 KW.)	58 arc, 85×2 inc.	33=188 H.P.	
435	WORKSOP	Worksop Urban District Council	1901	J. Percival Crowther	220 & 440	Direct ..	540	266	92 KW.	£27,822	15,538 (518 KW.)	35 arc, 136 cbn.	32=156 H.P.	
436	WORMIT	Tayside Electric & Gas Light Co., Ltd.	1898	E. A. Stewart ..	230	Direct ..	40	..	..	..	1,500 (50 KW.)	..	..	
437	WORTHING	Worthing Corporation ..	1901	G. Porter ..	230 & 460	Direct ..	538	292	69 KW.	£50,000	21,965 (732 KW.)	115 arc, 22 inc., 9 Nernst	24=90 H.P.	
438	WREXHAM	Wrexham Corporation .	1901	W. G. Pickvance	230 & 460 tr. 500	Direct ..	735	360 lg., 200 tr.	..	£37,975	..	41 arc, 190 mtl., 28 Nernst	29=105 H.P.	
439	YARMOUTH	Yarmouth Corporation .	1895	G. Bryant ..	100 & 200 tr. 500	83~, 1-ph.	735	382	..	£95,000	44,052 (902 KW.)	181 arc, 100 mtl.	38=70 H.P..	
440	YORK	York Corporation . ..	1900	J. W. Hame ..	230 & 460	Direct ..	1,860	976	400 KW.	£125,354	0,472 (2,016 KW.)	106 arc, 35 mtl.	155=1,023 H.P.	

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arc ..	..	..	..	..	.. ..	..	..	Electricity supplied by Rother Vale Collieries, Ltd. ..	399
arc, 157 ., 69 mtl.	39=82 H.P.	..	2,187.5 KW.	3.2	Lg. 6 & 3, or 4½; pb. lg. 1.93; pr. 2½ to 1¾	Max. demand, flat rate & 2 rate mtr.	899,733	Data to Mar. 1908	400
..	52=232 H.P.	..	2,525 KW.	18.5	Lg. 7 & 3, or 5½ w. free lamps; pr. 4 & 1½, or 2½	Max. demand, flat rate. & 2-rate meter	784,017	*Also S. Margarets o/T., Hampton Wick, Hampton Ct. and E. Molesey	401
rc, 8 cbn., ntl., 89 N. c, 54 mtl.	119=1,493 H.P. 15=870 H.P.	27 cars	2,486 KW. (ex. tr.) 1,150 KW.	14.8 12.9	Lg. 5 & 2 or 4½†; pr. 2½ & 1½, or 1½ & spl.; tr. 1½ to 1 (T side, 1½)	Max. demand and flat rate Max. demand and flat rate	1,454,086 507,109	Lg. & tr. *Bulk supply, 1,000 KW., from Carville. †Pb. lg., arc £16 & £13; N. £2, p.a. Data to Mar. 25, 1908 Data to Dec. 1907	402 403
c, 115 cbn., 5 Nernst rc, 43 cbn., 50 mtl.	33=65 H.P. 133=964 H.P.	.. ..	688.5 KW. 2,148 KW.	5.5 ..	Lg. 7 & 4, or 6; pr. 4 & 1½, or 2½ Lg. 4 (ch. 3), pb. lg. arc £13½, inc. £2 p.a.; pr. 1½ to 1 (hoists, 2)	Max. demand, flat rate & contract Flat rate	233,827 1,123,279	Data to Dec. 1907 .. ..

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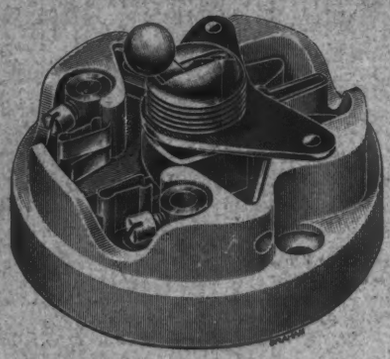

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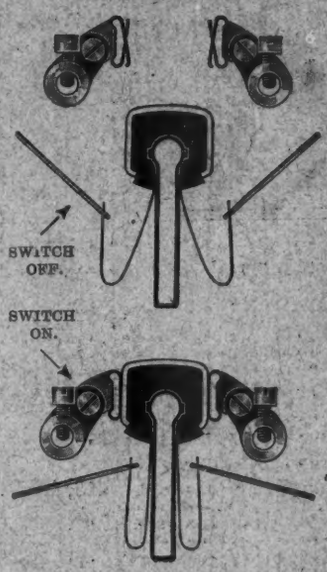

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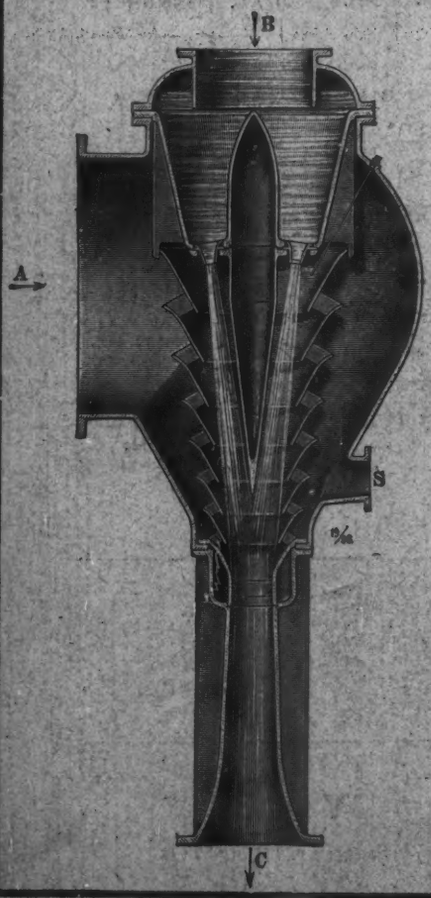

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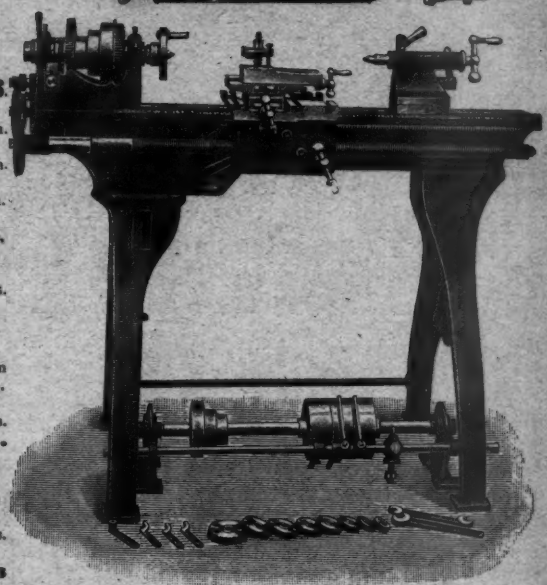

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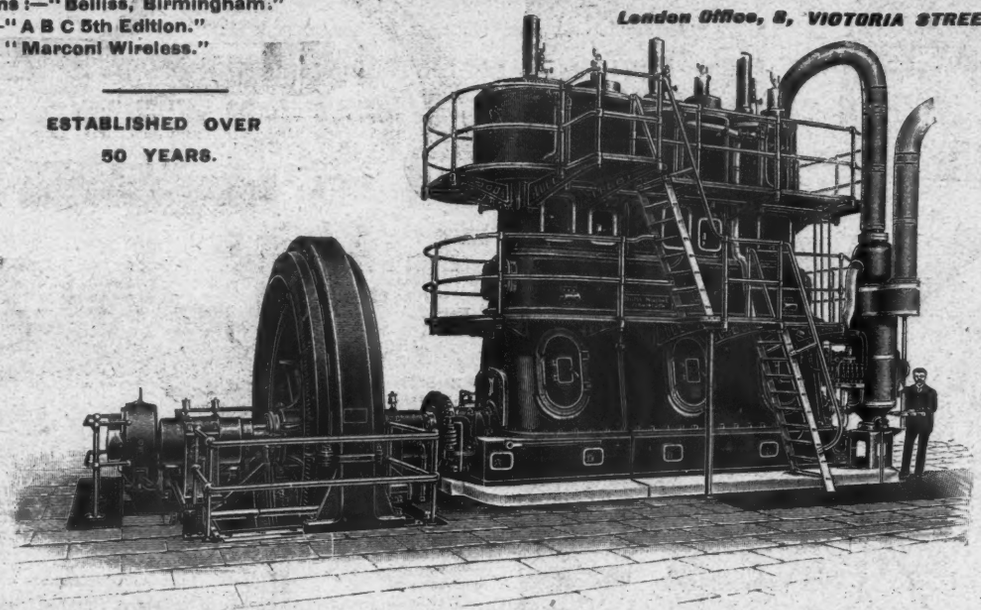

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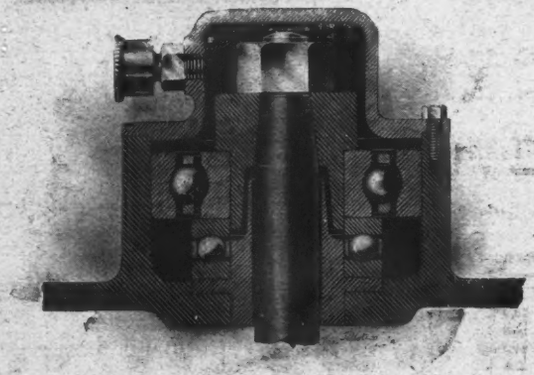

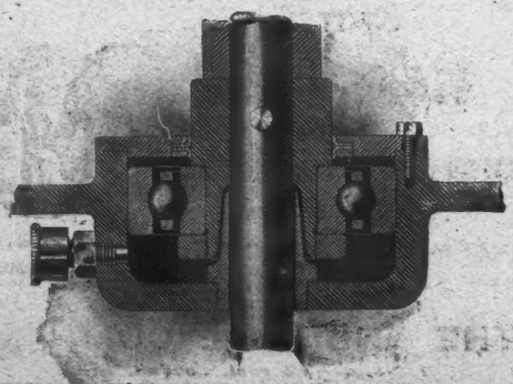

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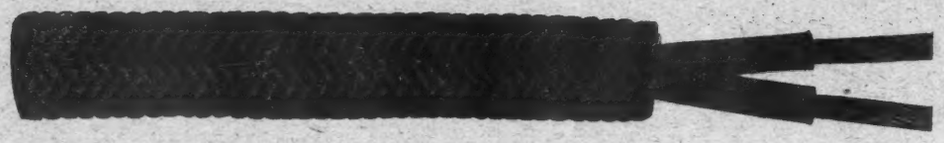

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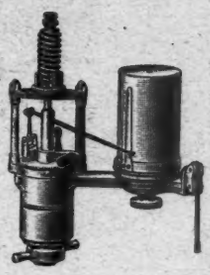

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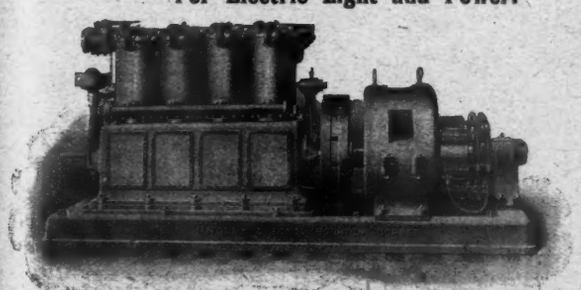

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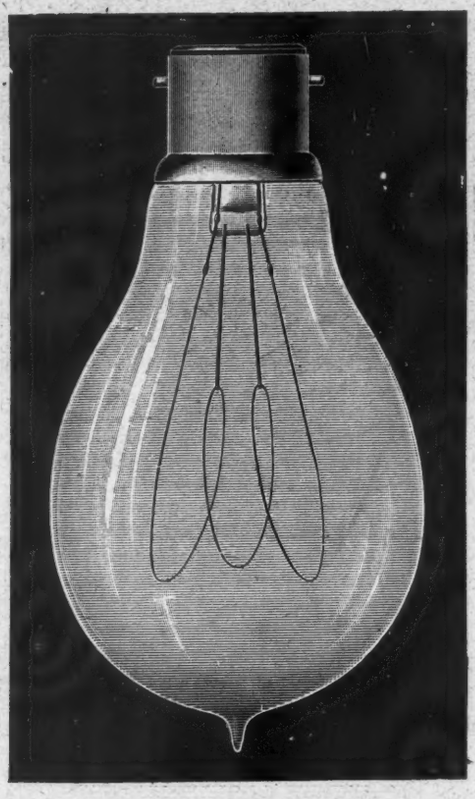

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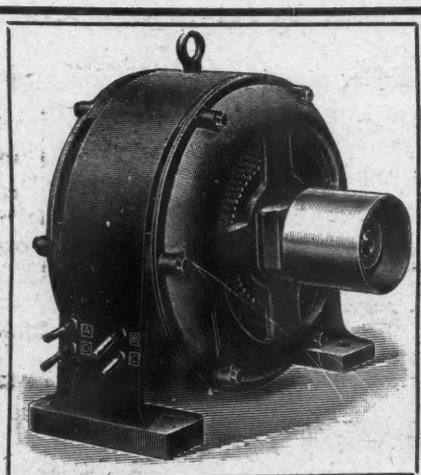

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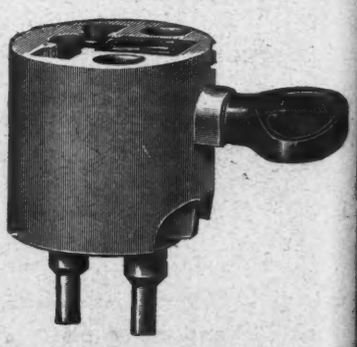

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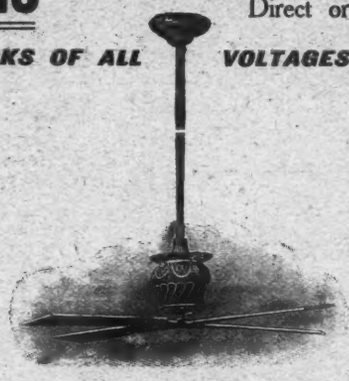

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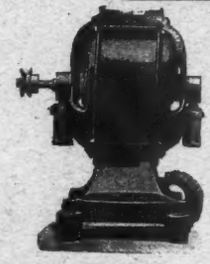

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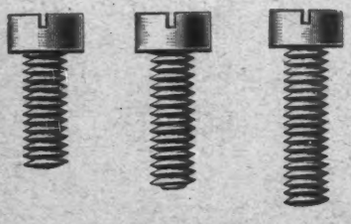

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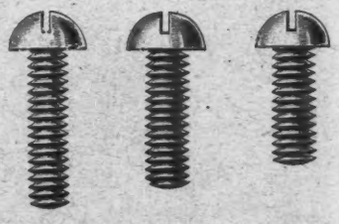

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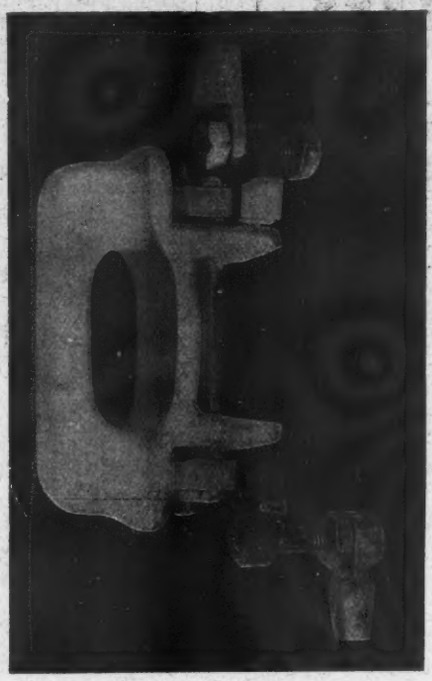

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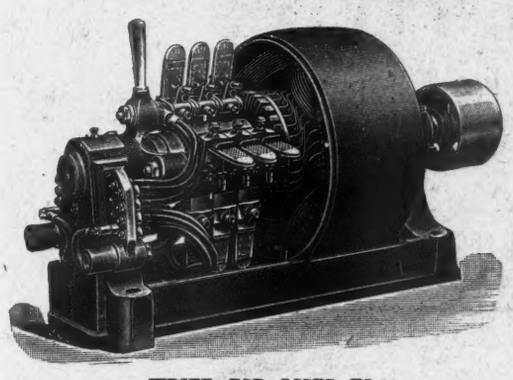

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SPEED REDUCING GEARS

FOR ELECTRIC MOTORS.

Totally Enclosed, Silent and Durable.

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OTHER SPECIALITIES: *High-Class Gear Cutting. Improved Flexible Couplings.*

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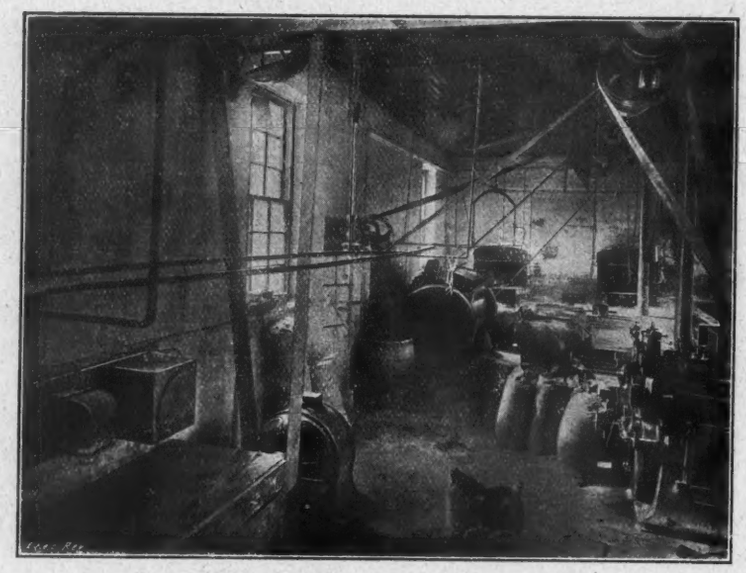

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AN ELECTRICALLY EQUIPPED BAKERY.

Views showing D.K. Stationary Motors in Operation

HANDY LAMPS ON HIRE.

A large stock of Lamps always ready, clear or varnished (all colours).

"GLOWIRE" STRIP may be hired on easy terms. We fit on the Lamps and forward it all ready for current.

"Handy" Cap with Loops open.

"Handy" Lamps with Flexible or Glowire Strip.

Being "Handy" Lamps they can be used with or without holders. Hiring conditions posted on application.

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"Handy" Cap connected direct to Flexible.

FESTOONS. Post us your flexible and we will connect on to it any number of "Handy" Lamps you may order. No charge for connecting on lamps.

Quickest, Cheapest, and Safest method for temporary wiring.

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THE STANDARD TYPE
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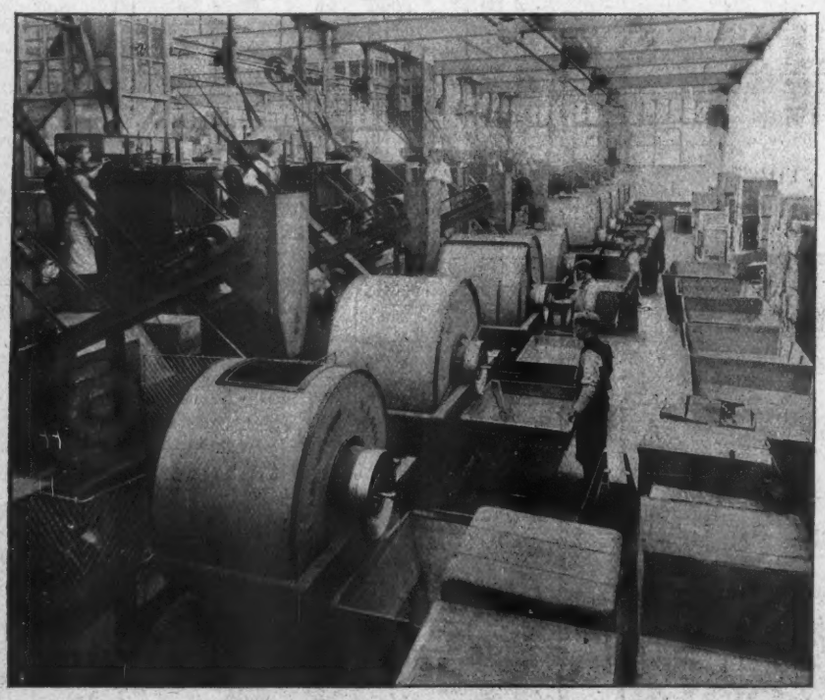

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This illustration shows
A ROW OF
TEA MIXERS
Driven by our Motors.

Each Mixing Machine holds a Ton of Tea.

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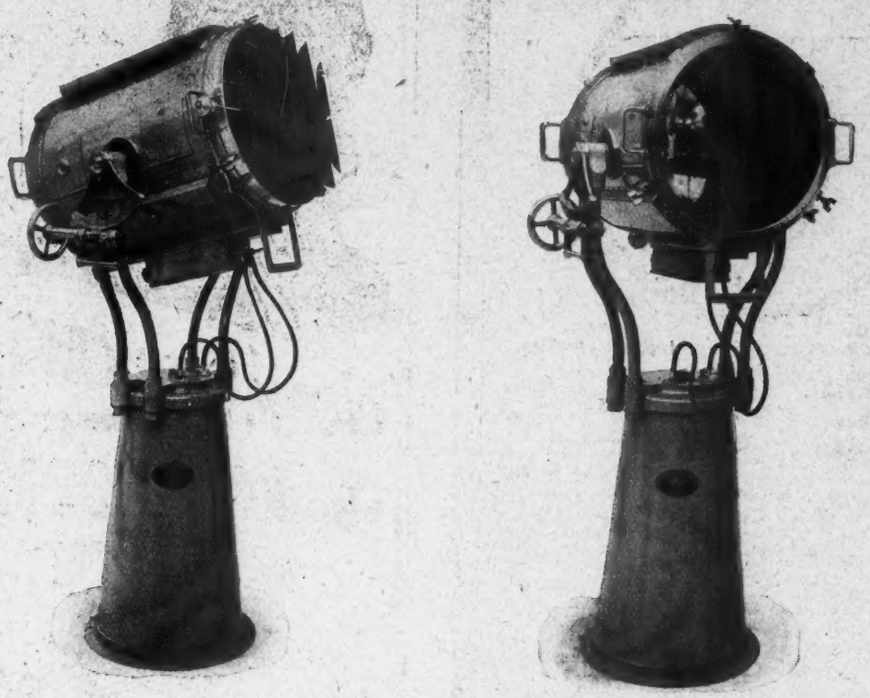

We manufacture Searchlight Projectors for Naval, Military and Mercantile purposes.
Our Machines are of First-class construction throughout, giving the highest efficiency obtainable, and possessing many novel features.

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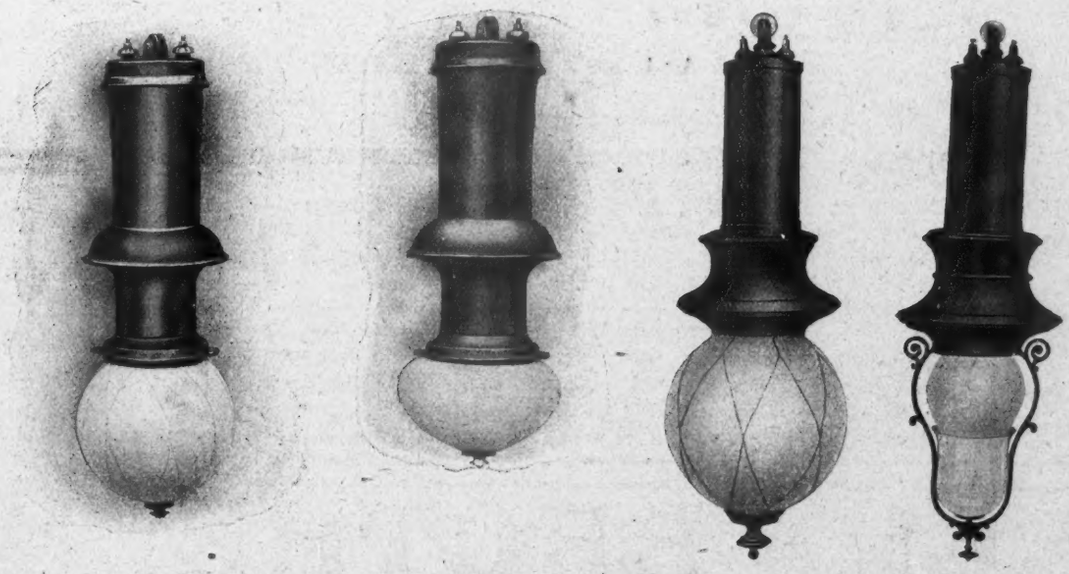

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Solderine Paste
FOR
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THE ORIGINAL BRITISH MADE FLUX.
CLEANS AND SOLDERS WITH ONE OPERATION.
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CANNOT FALL OFF.
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SAVES TIME.
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ASSURES A PERFECT JOINT.

Sold in ¼, ½, and 1 lb. Tins, also 6d., 1s., and 2s. size.

Manufactured by the Makers of
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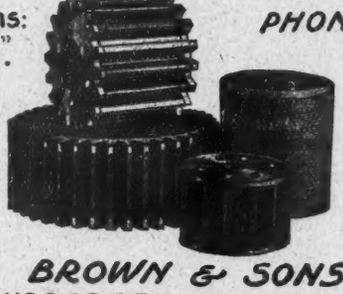

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IN A·1 AND G·1 QUALITIES
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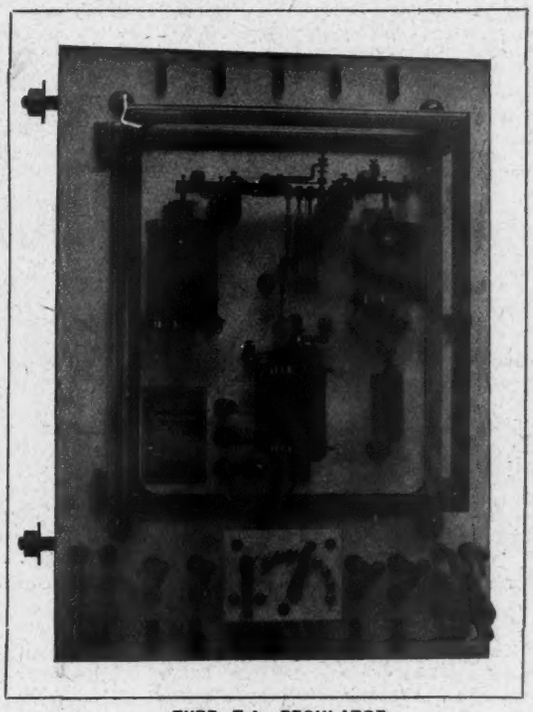

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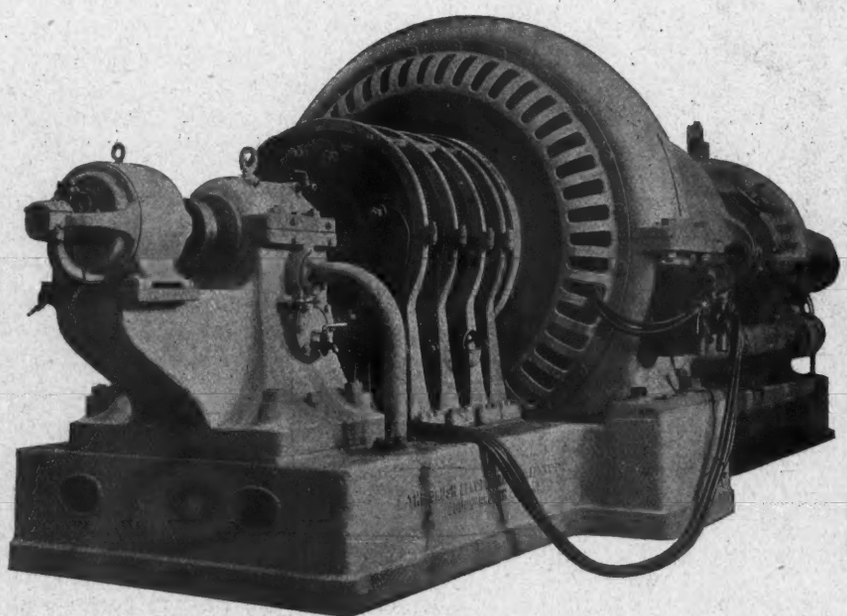
Manufacturers of Railway Signals, Cabins, Interlocking Levers, Block Instruments, and Signal Work of every description, Electrical and Mechanical.

THE **BRUSH PARSONS STEAM TURBINE** embodies all the latest improvements introduced or approved by the patentees, and is so constructed as to ensure Exceptional Reliability and Efficiency.



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Turbo-Generators for alternating and direct current are built complete by the

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OF ORIGINAL DESIGN

In OXYDISED SILVER,
ANTIQUE COPPER,
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CRYSTAL GLASS

The SHOWROOMS,
At 100, OXFORD ST., LONDON, W.,
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CONTAIN THE LARGEST AND MOST VARIED DISPLAY IN EUROPE.

Manufactory: BIRMINGHAM.

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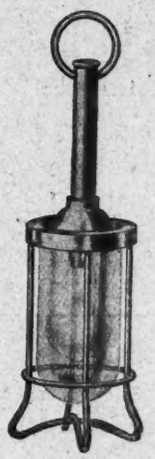

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WALL BRACKETS,
TABLE AND FLOOR STANDARDS,
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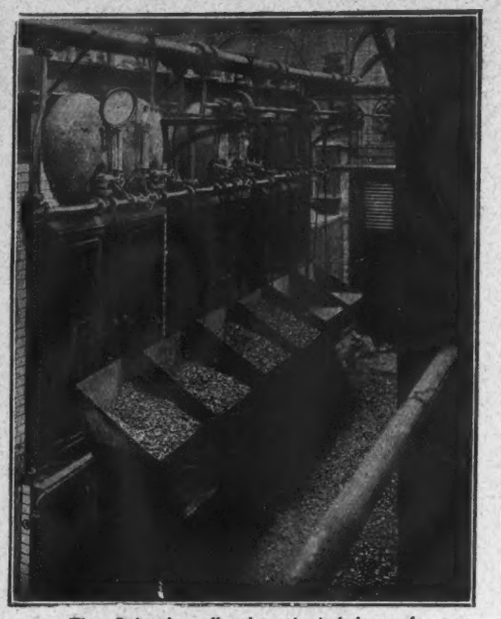
"SURPRISE" PENDANTS,
&c., &c., &c.



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Record Economy in the Boiler-House!

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'BENNIS' STOKERS

Installed on Water-Tube Boilers a

SAVING in FUEL COSTS

OF

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Address Your Questions to

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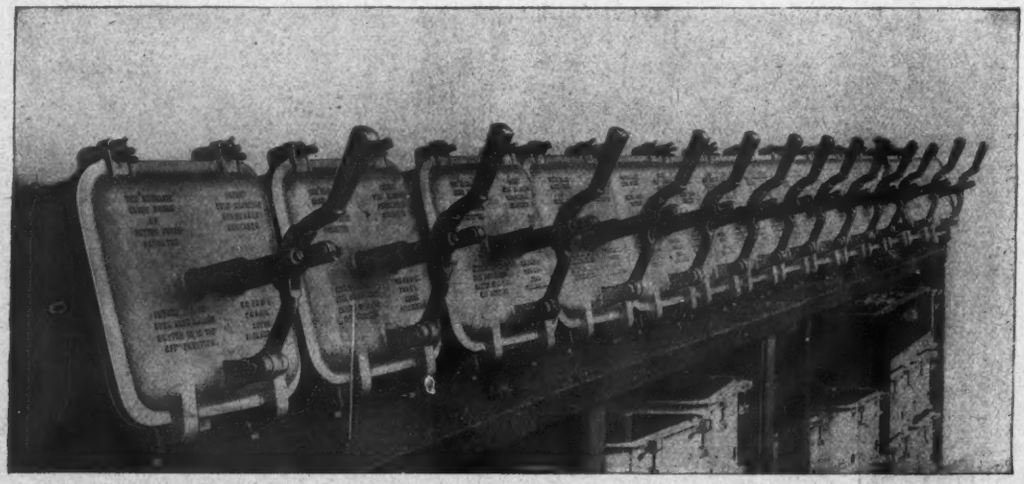

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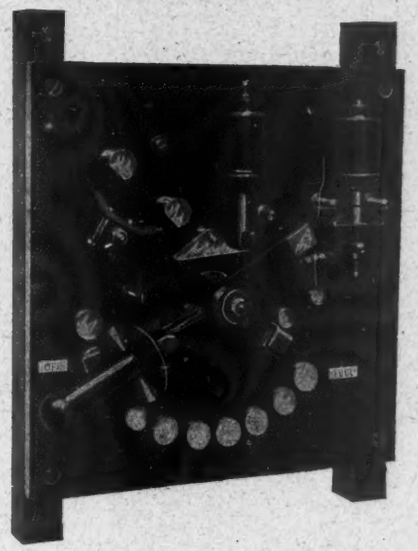

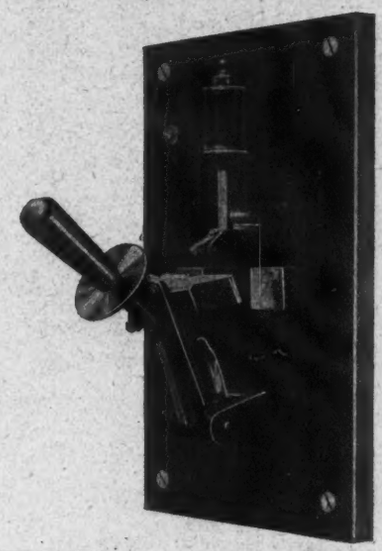

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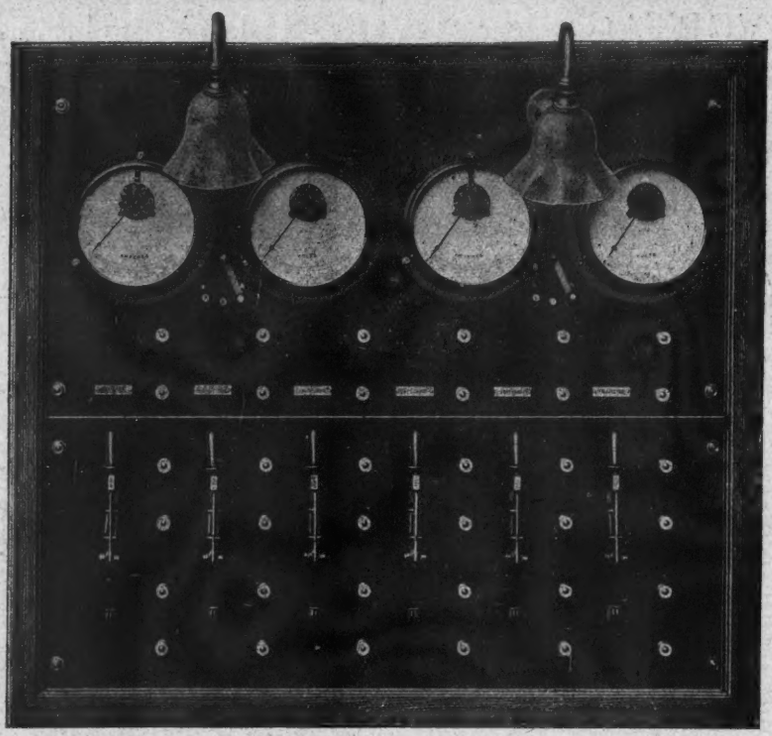

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This shows our Standard Pattern type "B" Marine Switchboard for working with Two Dynamos.

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To suit all Purposes.

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It did strive in Workmanship and Value. — Cymbeline, Act 2 Scene 4.—SHAKESPEARE.

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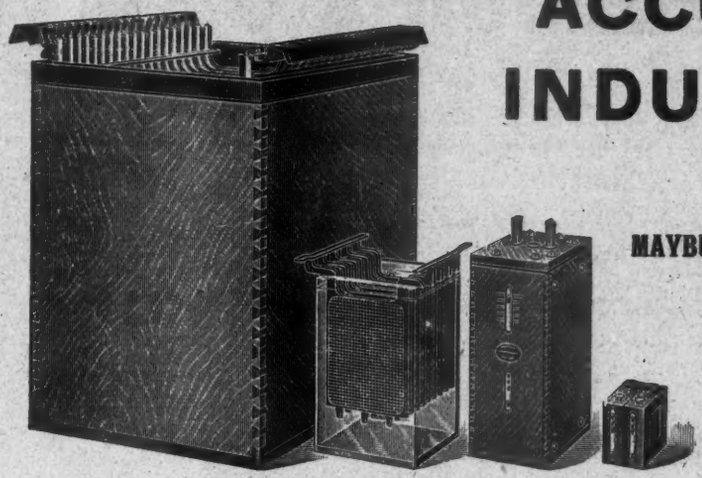

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VULCANISED RUBBER WIRES AND CABLES.
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AIR INSULATED TELEPHONE CABLES.

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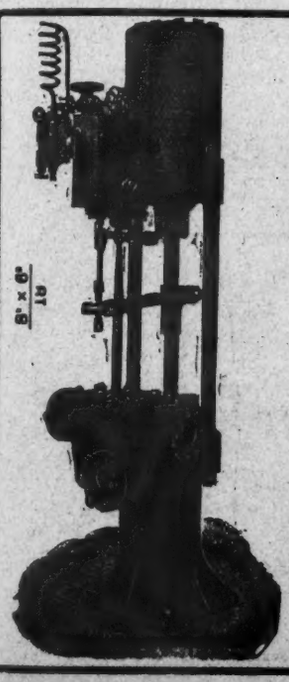

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HALL'S
Patent Direct-Acting
Boiler Feed Pump

ECONOMICAL and EFFICIENT.

An Ideal Pump for General Boiler-Feeding purposes.

UP-TO-DATE IN EVERY WAY,

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CARBON BRUSHES

FOR

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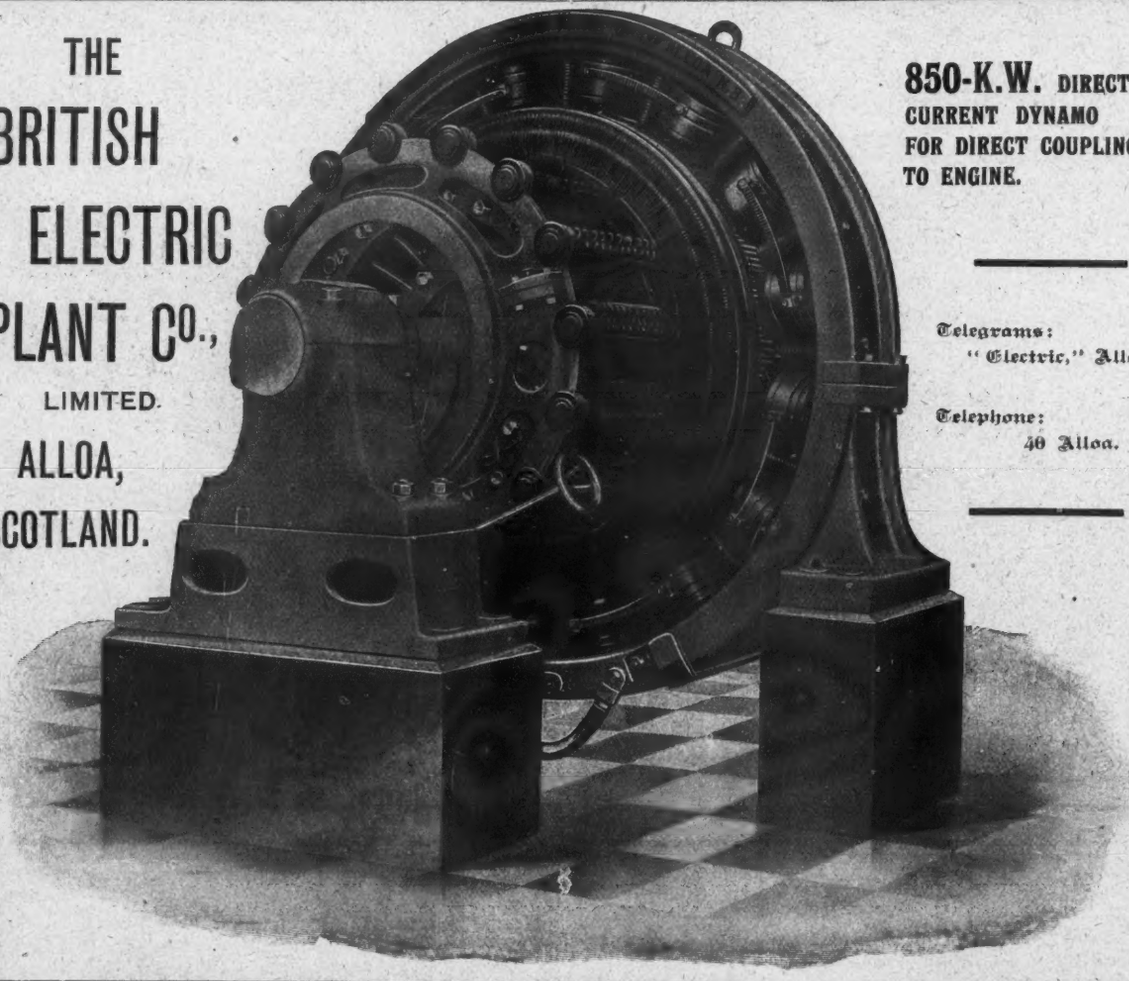

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HIGH GRADE ELECTRICAL INSULATING FIBRE.

Supplied in Sheets of 6 feet × 3 feet, from 5 mils to 5/32 in. thick.

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"SANTONI" FLAME LAMPS

NEED NO MORE ADVERTISEMENT, YOU CAN SEE THEM EVERYWHERE AT THE

FRANCO-BRITISH EXHIBITION.

349 *Are Lighting the*

STADIUM,
GARDENS,
MACHINERY HALLS,
PALACE OF ARTS, &c.

(NOT 332 AS WAS STATED LAST WEEK).

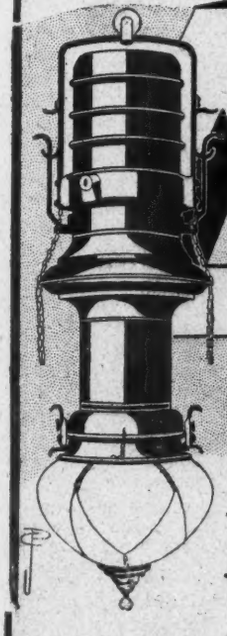
If you require THIS LAMP please apply to us, as we are the

SOLE VENDORS

of this particular make of Lamp with all its Accessories and Spare Parts, and are THE ONLY FIRM able to supply exactly what you require FIRST HAND. We are, however, also in a position to offer you a considerably

"IMPROVED PATTERN INTENSE FLAME ARC LAMP,"

which is our



ARCOFLAME

FIRST

amongst the good qualities of the "ARCOFLAME" INTENSE FLAME LAMP is its thorough efficiency. . . It is Economical, Reliable and Brilliant, and is destined to occupy . . . .

A PROUD POSITION.

Write for List A 10, which gives full particulars, including our Special

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ELDON STREET HOUSE, LONDON, E.C.

G. E. C. TELEPHONES.

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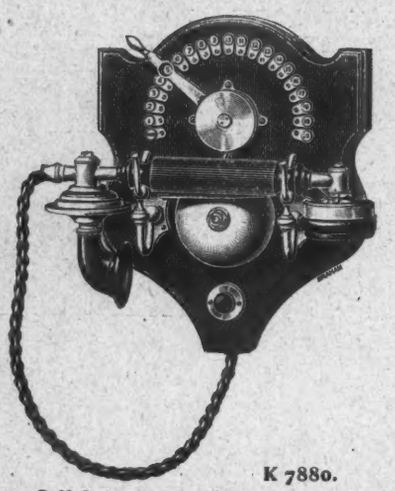
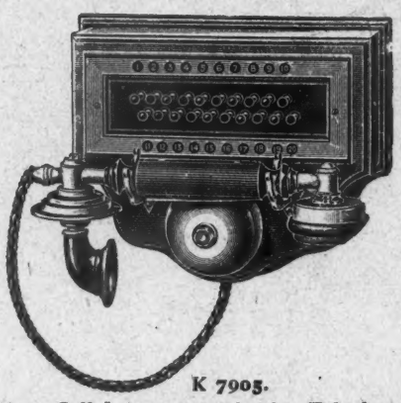


K 7880.
Battery Call Intercommunication Wall Telephone.
Shield Pattern.



K 7905.
Battery Call Intercommunication Telephone
The "S.R." (Self-Replacing).

K 7885.
Battery Call Intercommunication Telephone.
Table Pattern.

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ELECTRICAL and MECHANICAL (ESTABLISHED 1850).

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Original Testimonials should never be sent.

THE BRITISH CORRESPONDENCE SCHOOL OF ELECTRICAL ENGINEERING,
Dept. B., 38, MAIDEN LANE, STRAND, LONDON, W.C.
Write for particulars of Practical Home Tuition. 6189

WOOLWICH POLYTECHNIC.

AN Assistant Teacher is required in the Engineering Department, to take up duties in September next. A knowledge of Motor Engineering is essential. Commencing salary £150—£170 per annum. Applications must reach the Principal (from whom further particulars and forms of application can be obtained on receipt of a stamped addressed foolscap envelope) not later than WEDNESDAY, 15th JULY. 9174

WOOLWICH POLYTECHNIC.

A SECOND Assistant Teacher is required in the Engineering Department, to take up duties in September next. A knowledge of Electrical Technology is essential. Commencing salary £180 per annum. Applications must reach the Principal (from whom further particulars can be obtained on receipt of a stamped addressed foolscap envelope) not later than WEDNESDAY, 15th JULY. 9175

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AN Electric tramway company in South Wales has a vacancy for an Improver having a good technical knowledge and some works experience. Small salary to start.—Apply 9160, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

SITUATIONS VACANT.—*Continued.*

A LEADING Continental firm of incandescent lamp manufacturers require a first-class Representative with good connections among central station engineers, wholesale houses and contractors, who is prepared to devote his whole time to the sale of incandescent lamps. Applications from gentlemen with good connections and successful record will only be considered.—Please address, stating references, salary required, &c., "G. U. 1919," care of Neyroud & Sons, Advertising Offices, 14-18, Queen Victoria Street, London, E.C. 9125

APPLIED Mathematics.—Complete courses in Engineering Mathematics at reasonable fees. Our papers have been specially written for home study by fully qualified lecturers in Practical Mathematics. We have been established for over five years, and during that time hundreds of students have passed through our hands in all parts of the world, and we can give references to any one desiring same. Our system of "Tuition on Approval," free, gives an opportunity of testing our methods before enrolling.—Full particulars from THE CORRESPONDENCE SCHOOL OF ENGINEERING MATHEMATICS, Bilston, Staffs. 9066

APPLICATIONS for Appointments prepared in best form, ensuring consideration. Testimonials copied.—Apply for particulars, HERBERT GREATOREX, 4, Oxford Road, Ilford, E. 9132

APPLICATIONS are invited for the post of Works Fitter in a combined power station in the North of England. Commencing wage 36s. per week, advancing to £2. Applicants must have had previous experience in the running and repair of high-speed engines and boilers.—Apply early, stating age, where apprenticed, and previous experience, accompanied by copies of references, to 9149, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

APPOINTMENTS.—The Higher Telegraph Services afford splendid opportunities to youths and young men not content with earning 25s. to 30s. per week. Commencing salaries from £150 per annum. THE LONDON TELEGRAPH TRAINING COLLEGE, LTD., secures these appointments for its students. All systems of Wireless Telegraphy practically taught. Write for Prospectus to MANAGER ("C"), Morse House, Earl's Court. 9099

CANVASSERS.—Large municipal undertaking in London requires two first-class Canvassers. Good previous experience necessary; both technical and commercial knowledge essential. Salary £3 per week.—Apply, enclosing copies of testimonials, to W., c/o Scripps's Advert. Offices, 13, South Molton Street, W. 9183

COIL Winder (male or female), experienced, state wages, &c.—9163, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL Engineering.—Apply for detailed syllabus of Correspondence Courses in Electrical Engineering; and also in Practical Mathematics, Mechanics and Machine Drawing.—UNIVERSITY ENGINEERING COLLEGE, Stanstead Road, Forest Hill, London, S.E. 9179

ELECTRICAL Working Engineer required, to take charge of a small plant at cement works on the South Coast.—Apply, stating age, references, and salary required, to 9119, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ENGINEER wanted, to take charge (under supervision) of works plant, three-phase, and D.C. high speed engines, B. & W. boilers. Should be good draughtsman with factory driving experience.—Full particulars and salary required to 9124, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

EXCEPTIONAL opening for bright young Commercial Assistant, able to invest. Unique prospects of advancement. Salary according to experience, and 7½% interest paid from permanent contracts of absolute security.—Particulars in confidence to 8997, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

(Continued on next page.)

SITUATIONS VACANT.—*Continued.*

EXPERIENCED Switchgear Draughtsman wanted. Must be capable of turning out high-class work.—Apply by letter, stating, age, experience, and salary, &c., to JOHNSON & PHILLIPS, LTD., Old Charlton, S.E. 9151

IMPROVERS.—Vacancies occur for switchboard duties, also distribution work, small weekly wage. Preference to candidate having had some experience in A.C. working.—Applications, with particulars, to be forwarded not later than July 13th, to the BOROUGH ELECTRICAL ENGINEER, Electricity Works, Dover. 9100

JUNIOR Power House and Sub-station Assistant, modern electric plant, South Coast. College course or some experience desirable. State age and references. Salary after first two months.—9146, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

LARGE City Supply House wants energetic Showroom Assistant, with practical knowledge and capable of arranging showrooms of electrical fittings.—Apply by letter, stating age, experience, and salary required, to 9110, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

OVERHEAD Tramway Linesman wanted at once.—Apply 9092, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

PREMIUM Pupil.—Vacancy in modern central station in London.—Apply 9054, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

PUPIL.—A well-known Westminster engineer is prepared to receive one Pupil in tramway, railway, and lighting work for three years, with the possibility of Continental experience and a good salaried appointment before the expiration of that period.—Please address in own handwriting, stating particulars as to age, education, &c., by letter only, W., 31, Vincent Square, S.W. 9197

PUPIL to qualify as assistant in small central station wanted. Laying mains, house wiring, charge of shift. Age 18 or over. Premium 30 Guineas.—Apply 8995, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

SMART Draughtsman used to Switchboard Erecting, also resistances, Manchester district. State age, wage and references.—9167, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

STRETFORD U.D.C.—A vacancy has occured for an Arc Lamp Trimmer, one accustomed to Brockie-Pell lamps and Angold flame arc lamps, and to be capable of doing his own repairs. Salary 30s. per week.—Apply, giving all particulars, to R. ROWLAND, A.M.I.E.E., Generating Station, Stretford. 9118

TO Parents and Guardians.—Good salaries are obtained by young men trained for positions in the Submarine Cable and Wireless Telegraph Services. Fees moderate. Easy method of payment if desired.—Write SECRETARY, British School of Telegraphy, 179, Clapham Road, London, S.W. 9191

TRAVELLER.—Additional Traveller required for London, for arc lamps, transformers and accessories.—Apply FOSTER ARC LAMP AND ENGINEERING CO., LTD., Wimbledon, S.W., by letter first, giving full details. 9150

TRAVELLER for the sale of Metal Filament Lamps, Accessories, Cable, &c., by an old established firm; good salary and commission offered for a reliable and experienced man; must be well known in the trade.—Address V. S. T., at Horncastle's, 61, Cheapside, E.C. 9131

TUTOR.—Gentleman required as Tutor in Electrical Engineering. State qualifications and references, by letter.—THE CORRESPONDENCE COLLEGE CO., 26, Green Street, Cambridge. 9126

WANTED, Junior in central station mains department, with knowledge of drawing. Wages 10s. to 15s. per week, according to ability.—Applications to 9115, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

WANTED immediately, Assistant in Estimating Department for motor starters and switchgear accessories. One with previous and practical experience preferred.—Reply, stating age, experience, wages required, and references, to A. REYROLLE AND CO., LTD., Hebburn-on-Tyne. 9117

WANTED, Assistant for mains and meters, North of England, 29s. per week.—State age, experience, and recent testimonials, to 9116, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

WANTED an experienced Armature Winder accustomed to traction work with the British Westinghouse and British Thomson-Houston Companies' equipments. Also a Man experienced in building up Commutators for the same firms' motors and motor generators. Applicants to state age, experience and wages required.—Address "C. J. M.," care Davies & Co., Advertising Agents, Finch Lane, Cornhill. 9098

WANTED.—Shop Inspector of Junction Boxes and Feeder Pillars to fill up spare time on jig and tool making.—9177, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

WIREMAN required by firm of Electrical Contractors; one who lives in the West End.—Apply 9108, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

SITUATIONS VACANT.—*Continued.*

WORKS Foreman wanted, within seven miles Manchester, to control fitters, turners, machine men, &c. Must be thoroughly practical, strict disciplinarian, and well versed in modern machine shop methods. 6 o'clock man. Non-union.—Give full details experience, age, wages required, &c., 9111, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

YOUNG Electrical Engineer wanted at once, experienced on bench and lathe.—State age, wage, and full particulars, BERNARD G. JONES & Co., Electrical Engineers, Newport, Mon. 9144

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A CAPABLE Draughtsman is at present engaged on temporary work for a firm of dynamo and motor manufacturers, who wish to recommend him to any who may require the services of a competent man.—9148, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ADVERTISER seeks position, Salesman, Despatch Clerk, Storekeeper; 12 years' experience, excellent references, low salary to commence.—9135, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ADVERTISER (24) seeks Situation, lathe and vice, well up in alternating and direct-current motor and arc-lamp repairs, wiring, &c.—K, 244, Fore Street, Edmonton. 9097

ADVERTISER (34), desires permanency, Working Foreman or Branch Manager. Long practical experience, lighting, power, ventilating, heating, telephones, &c., also buying, estimating and control of men.—9104, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ADVERTISER (23), seeks Situation as Storekeeper, Despatch Clerk, or any capacity; excellent references.—BROWN, 129, Coventry Street, Cambridge Road, N.E. 9180

ADVERTISER (27) requires change; six years' electrical and mechanical experience, two years' college training, two years central station.—9159, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

A FOREMAN Wireman disengaged; three, five, seven years' references.—9051, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

A GOOD Record.—Successful commercial development. Central Station Engineer disengaged. Home or abroad.—A. B. CHILD, "Melrose," Milton Road, Hanwell, Middlesex. 9182

A GOOD all-round Man desires a situation to take charge of a factory or private plant; experienced in installing and running gas and oil engines, dynamos, motors, gas plants, accumulators, &c., can undertake all repairs, electrical or mechanical. Would be willing to install complete factory or private plant and afterwards take charge; good references.—Apply H. C., 154, Cecil Street, Watford, Herts. 9157

AS thorough Electrician's Mate, used to intercommunication telephones and bells, arc lamps, &c., and jointing. Moderate rate for permanent sit.—47, South View Road, Hornsey. 9130

A THOROUGH Practical Electrical and Mechanical Engineer (34), seeks permanency. First-class mechanical and electrical consulting engineer. References. Could invest small capital, £200.—9073, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ATTENDANT Driver, suction gas, oil, pumps, machinery; wireman, best class work, accumulator repairs, gas fitting, carpentering, storekeeper, timekeeper, anything permanent, low wages.—BRAY, 140, Finborough Road, S.W. 8964

CERTIFICATED Electrician (young) seeks situation; 4½ years' practical experience, all branches.—116, Sugden Road, Battersea, S.W. 9137

(Continued on next page.)

SITUATIONS WANTED.—*Continued.*

CHIEF Assistant, central station (29), disengaged, requires post, excellent testimonials, lighting, power, H.T. and L.T., also private plant. Technical college and workshop experience.—"Engineer," 23, Ashley Road, Bristol. 9036

COMPETENT Electrician, disengaged. Foreman or working. Last 3 years foreman over large three-phase and D.C. lighting and power job. Town or country.—W.H., 22, Stonenest Street, Tollington Park. 9053

COMPETENT Electrician; five years foreman over large H.T. three-phase and D.C. lighting and power job; traction, colliery, and technical experience.—Z., 6, Bothwell Street, Hammersmith. 9156

COMPETENT Wireman (young) seeks situation; rate moderate; or job any capacity on works, railway, or tramway; references.—C. A., 62, Abdale Road, Shepherd's Bush. 9192

DRAUGHTSMAN (25), capable, wants engagement. Sound practical experience and theoretical training. Good references.—J. H., 37, Plashet Lane, Upton Park. 9190

DRAUGHTSMAN, disengaged, experienced switchgear, cable work, arc lamps, &c., would take charge of office.—9140, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

DRAUGHTSMAN (28), practical, experienced extra high-tension work.—9193, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRIC Wireman, thoroughly efficient, good all-round man. Highest references.—F., 10, Beaconsfield Road, Leyton. 9029

ELECTRICAL Engineer, 16 years' central station practice, 12 years as chief engineer and manager, disengaged shortly and would take responsible position in firm of mechanical or electrical engineers, good organiser and used to handling large schemes, experience with D.C. and A.C. machinery, transmission and conversion plant, for power, lighting and traction. First class references.—9072, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL Engineer, at present with prominent electrical firm, and accustomed to the control of men; desires responsible position, 12 years' experience in the design and manufacture of electrical machines, A.C. and D.C. Latest experience in Admiralty Practice. First-class references.—8990, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL, Mechanical, Draughtsman, Designer, six years. Engines, special machinery.—Wcsc, 55, Aspenlea Road, Fulham. 8954

ELECTRICAL Engineer (diploma) with five years' experience in electric undertakings requires situation.—9103, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL Engineer (26) desires charge of private plant, preferably gas; own repairs and wiring, with motor-car experience.—9168, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICIAN seeks re-engagement, town or country; good references.—SMITH, 2, Braden Street, Shirland Road, W. 9094

ELECTRICIAN desires Situation, highest references, thorough training, workshop and estate experience, installing, testing, maintenance of plant, suction gas, motor car, and house repairs.—9082, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICIAN desires charge of plant, gas or steam, country preferred.—J., 293, St. James Road, S.E. 9055

ELECTRICIAN Wireman (23), seeks re-engagement. Lighting, telephones, motors, &c.—35, Calverley Grove, Upper Holloway. 9142

ELECTRICIAN (25), experienced. Plant, lifts, power and house-wiring.—COVINGTON, 44, Leswin Road, Stoke Newington. 9178

ELECTRICIAN (21), seeks situation. Smart repairer, lamps, motors, bells, telephones, &c. Manage electric light plant.—UNIT, 10, Hemdean Road, Caversham, Reading. 9136

ELECTRICIAN-Wireman (experienced), or take charge of private plant; good references.—G. D., 47, Kingston Lane, Teddington. 9041

ELECTRICIAN'S Mate (21) seeks situation; can work alone.—W. P., 12, Prince's Road, Penge, S.E. 9154

ENGINEER (27), six years power, light, and traction, desires to enter estimating department of manufacturing firm.—9153, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FIRST-Class Wireman disengaged, quick, reliable, all branches.—FINLAYSON, 21, Leverett Street, Chelsea. 8972

FIRST-CLASS Marine Engineer desires berth ashore, five years' shop, eight years' sea experience; very good references.—8957, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FOREMAN Electrician seeks charge of direct-current plant. Thoroughly experienced with arc and incandescent lighting, motors, generators, accumulators, telephones, gas engines, and control of men; technical experience.—9057, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

SITUATIONS WANTED.—*Continued.*

FRANCO-BRITISH Exhibition, as Representative, young man (28), experienced generating, extra high-tension transmission and transforming plant. Salary £3 weekly.—9194, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

IMPROVER wants work, 5 years' experience.—"IMPROVER," 8, Falcon Grove, Falcon Road, Battersea. 9169

MAN (23), re-engagement as Electrician's Mate, used to electric lift work.—F., 3, Bath Terrace, Union Road, Southwark. 9025

MASTER Engineer requires foreman's job, A.C., D.C., new or repairs, £175.—D., 29, Middle Street, Southsea. 9101

SALESMAN, with connection, seeks re-engagement, 12 years' good references.—9152, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

TOOLMAKER, first class, desires change; press, jigs, capstans, &c., five years' experience of charge of shop, good references.—E., 41, Drayton Road, Harlesden, N.W. 9078

WIREMAN (28), abstainer, excellent refs., permanency preferred.—C., 12, Elmfield Road, Walthamstow. 8981

WIREMAN, lighting, bells, telephones, casing and barrel.—J., 7, Burlington Road, Bayswater. 8966

WIREMAN (30), disengaged, lighting and power.—A. E. M., 47, Ingleby Road, Ilford. 8982

WIREMAN, disengaged, excellent refs.; casing, Simplex.—G. S., 8, Junction Road, Reading. 9071

WIREMAN (disengaged), competent, all systems; town or country; references.—F. W., 60, Marylands Road, Paddington. 9020

WIREMAN, Jointer, Fitter, young, all-round hand, wants work.—GABE, 24, Cavour Street, Walworth. 9096

WIREMAN wants work, town or country.—"ELECTRUS," 50, Salisbury Road, West Kilburn. 9102

WIREMAN, disengaged, good all-round, town or country; references.—A. G., 361, Edgeware Road, Paddington. 9105

WIREMAN disengaged, 11 years' experience (age 28).—H., 14, Sterndale Road, Hammersmith. 9133

WIREMAN wants work; light, bells, 'phones, town or country.—J. D., 18, Bouverie Street, Praed Street. 9145

WIREMAN, good all round, requires re-engagement; Simplex, casing or barrel, good references.—TOMLINS, Randall Lodge, Raynes Park, S.W. 9139

WIREMAN seeks employment, all systems, any distance.—T., 9, Croft Road, Wallingford. 9171

WIREMAN (Lighting, power), experienced mechanic, all branches; generators, motor, complete installations.—DALEY, 20, Powell Street, Goswell Road. 9185

WIREMAN (all round) wants Job, town or country.—ELECTRIC, 41, Medina Road, Holloway. 9184

WIREMAN disengaged. Good references. Town, country.—"ELECTRICIAN," 11, Gorringe Park Parade, Tooting. 9176

WIREMAN, 10 years' experience, all systems, disengaged, any distance.—MEGROFF, Barrack Road, Great Waltham, Chelmsford. 9038

WIREMAN, disengaged, good all-round, 11 years' experience, town or country.—A. H., 11, Stanley Street, Paddington. 9030

WIREMAN, young, seeks situation, good references. Rate 7d.—OLIVER VERRON, 30, Luxor Street, Camberwell. 9031

YOUNG Man (24), four years workshops, electrical and mechanical, nine months D.O., seeks situation.—8949, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

YOUNG Man (23) requires sit., any capacity.—W. H. T., 71, Albion Road, Dalston. 8951

YOUTH (19), requires situation to look after electric plant, &c., has been four years, assistant engineer. Lighting, accumulators, bells, steam heating, cooking, &c. Good references.—F. WILKINSON, East End, Middleton-One-Row, Nr. Darlington. 9074

YOUTH (age 18), three years' experience in electrical engineer's office, desires re-engagement, salary £1 per week. Excellent references.—9138, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

£20 OFFERED.—Electrician requires better position; 11 years' experience lighting and power, technical experience, highest references.—9181, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

(Continued on next page.)

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EXCEPTIONAL opening for smart Gentleman of pushing disposition in progressive London wholesale business. Secretaryship vacant. Qualification £1000. Full investigation granted.—Principals only address 9083, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

EXPERIENCED and successful Station Engineer, with Capital, wishes appointment as Managing Director of a Supply Company.—Communications will be received in strict confidence, and should be addressed in the first place to 9077, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

GOOD opening for manufacturer of switches and switchboards, &c., to amalgamate with old-established manufacturing business house with first-class connection, to extend manufacturing operations.—Apply, with full details, to 9109, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

£3000 required for investment in Electrical Contracting business. Electrical Engineer with experience preferred or gentleman wishing to qualify as Engineer. Profits would average, with services about 40 per cent., without services about 25 per cent.—9106, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

AGENCIES.

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AGENTS required, having connection amongst ship and bridge builders, boiler and motor car makers, to extend sale of Electrical Specialities.—Write "SPECIALITY, 122, Westwood Road, Seven Kings, Essex. 9035

AGENTS wanted to sell Consol Incandescent Electric Lamps, low and high voltage, 5s. 6d. per dozen. Liberal commission. Terms and sample from CONSOL ELECTRIC LAMPS, 17, Victoria Street, London, S.W. 9107

CABLES.—Advertisers are prepared to appoint sole District Agents for the sale of High-Class Cables and Wires. Applicants must be able to influence good orders.—Apply in first instance 8965, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

EXPERIENCED Engineer, A.M.I.E.E., with office at Westminster and influential connection, open to accept London representation of good Engineering Specialities.—9033, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FIRMS of standing required to take up Sole Agency for the sale of first-class new Electric Accumulators in Liverpool, Newcastle, Glasgow, Cardiff, Southampton, Portsmouth, Plymouth, Chatham, Dublin, Belfast, &c. (guaranteed outputs, light weight, no buckling of plates, and many other advantages).—Apply to RICHARD PAPE, LTD., Albion House, New Oxford Street, W.C. 8834

GREAT Britain.—Successful Firm, with Warehouses and Offices in London and Provinces, is open to Represent a first-class Continental Manufacturer of Insulated and Bare Wires, Cables of heavy construction.—8993, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

LONDON.—Well-known Firm, with good selling organisation and offices in City is open to Represent a Manufacturer of sound reputation with either Electrical or Mechanical Specialities.—8991, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

LONDON Representation.—Firm, well placed, offers to efficiently follow up and develop the City and Export Business of a Provincial or Continental Manufacturing Firm.—8992, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

NORTH of Leeds.—Electrical House, long-established, with large and successful business amongst Colliery, Shipyard, Steel Mill, Tramway and Railway Companies and the Trade, offers to represent a high-class Heavy Speciality Manufacturer. Full particulars to 8994, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

BUSINESSES FOR SALE AND WANTED.

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BUSINESS for Sale in S.W. district of London. About £100 required. Partnership could be arranged.—9186, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL Engineering Business in Ireland for sale. Manufacturers of continuous-current dynamos and motors; extensive repairs done, and trade increasing yearly. Works and offices well constructed on site offering plenty of scope for extension. Price £3000. A most unique opportunity for gentleman having had high-class technical training in cross-Channel electrical works.—8944, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

ELECTRICAL Contractors' Stock and Fixtures, about £200. Low price to quick purchaser. Manufacturing town in Midlands.—9032, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FOR SALE.

BUYERS AND SELLERS OF IMPORTANT SECOND-HAND
ELECTRIC LIGHTING AND POWER PLANTS,
in good running order, are requested to COMMUNICATE with
WHEATLEY KIRK, PRICE & CO.,
46, Watling Street, London, E.C.

CASH BUYERS AND SELLERS
OF
ELECTRIC LIGHTING AND POWER PLANTS
for re-use or dismantling,
Also Machine Tools and Miscellaneous Plant.
THOMAS MITCHELL & SONS, LTD., Bolton. 8948

FOR IMMEDIATE SALE.

THE remaining portions of the Generating Plant, &c., at the Corporation Electricity Works, Dale End, Birmingham, *must be removed at once.* It consists of

One set only, Willans-Crompton 182 KW. 220/260 volts, shunt wound.
Two sets Willans-Crompton 120 KW. compound-wound, 110/135 volts.
One 12-inch Berrymans Feed-water Heater. In most excellent condition. Extremely low prices.

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West Walls, Newcastle-on-Tyne.
Wires "Potential," Newcastle-on-Tyne. 9018

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DYNAMO, New, by Ediswan Co., 220 volts, 40 amps. Compound, £30.—LAKE, 132, Upper Thames Street, London. 9089

DYNAMO by Parkers, Wolverhampton, 170 amperes 440/500 volts, 2 bearings, 4-pole with interpoles, 160 r.p.m., suitable direct coupling or belt drive, cheap.—MARTIN, Electrical Engineer, Kidderminster. 8955

DYNAMOS, 3000, 1500, 1000 and 750 amperes, at 6 volts, ready for delivery; also smaller sizes delivered from stock. Machines let out on hire.—CANNING & Co., Electro-Platers' Engineers, Birmingham. 8025

DYNAMOS, nearly new, E.C.C., shunt wound, 20 amps. 70 volts, and 30 amps. 140 volts, perfect working order—bargains—C., 23, Chapel Street, Cripplegate, E.C. 9188

(Continued on next page.)

FOR SALE.—*Continued.*

FIELD Magnet Coils, suitable for dynamo, 30—35 amperes, 80—100 volts.—9155, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FOR Sale, 1000 KW. Westinghouse Generator, 460 to 570 volts, built for use on traction and lighting circuits, running either as shunt or compound. Speed 85 R.P.M.. Armature bored for pressing on 24-inch shaft.—For full particulars write Box 4924, Williams's Advertisement Offices, Bradford. 9037

FOR Sale.—One 110-volt 55-amp. Dynamo, first-class condition. A bargain.—E. A. HALL, Market Place, Grimsby. 8984

FOR Sale, 90-H.P. National Gas Engine, only worked nine months, good as new; satisfactory reasons for disposal. Also 150-H.P. Dowson Producer. Full particulars on application.—CLEVELAND TRUST, LTD., Middlesbro'-on-Tees. 8969

FOR Sale.—Four Willans Compound 111 Engines, each coupled direct to E.C.C. shunt-wound Dynamo, output 675 amperes, at 230 volts, 350 r.p.m.—Apply RESIDENT ELECTRICAL ENGINEER, 24, Hatton Garden, Liverpool. 8168

FOR Sale or Hire, high-class Dynamos, Motors, Alternators, Cable and Arc Lamps.—PERCY HUDDLESTON & Co., 72, Finsbury Pavement, E.C. 8942

FOR Sale.—150 KW. Generating Set, 230 volts 625 amps. 390 revs.; Vertical Compound Corliss Condensing Engine, 16" × 32" × 36"; Horizontal Compound Corliss Condensing Engine, 17" × 28" × 42"; 51-B.H.P. Stockport Gas Engine; 27-B.H.P. Crossley Gas Engine; 24-B.H.P. Oil Engine (By Blackstone); Dynamo, 220 volts 310 amps. 500 revs.; Dynamo, 220 volts 250 amps. 850 revs.—Full List of over 3000 lots of Machinery post free, THOS. W. WARD, LTD., Albion Works, Sheffield. Telegraphic Address: "Forward, Sheffield." 7809

FOR Sale, 11-KW. Ransomes, Sims Engine, direct coupled to a C.C. "Castle" Dynamo, 110 volts 100 amperes, 375 r.p.m.; cheap.—WILLIAMS, 73, Queen Victoria Street, E.C. 9164

FOR Sale, 75 KW. Steam Turbo Generator, 110 to 140 volts 750 amperes, with all fittings as fixed, left off work. Immediate delivery.—WILLIAMS, 73, Queen Victoria Street, London, E.C. 9165

FOR Sale, 85-KW. Marshall Compound Two-crank Engine, direct coupled to a Siemens dynamo, 220—250 volts, 340 amps., 185 r.p.m., immediate delivery.—WILLIAMS 73, Queen Victoria Street, London, E.C. 9166

FOUR Braulik Flame Arc Lamps, 10 ampere. Can be seen burning.—Apply THE ELECTRICAL ENGINEER, Electricity Works, Stratford-on-Avon. 9158

GAS Retort Carbon for Sale. We supply the trade.—V. DASNIERES, 10, St. Mary Axe, London, E.C. 9195

GLASS Shades for Electric Lighting in every variety of design and colour.—JOHN WALSH WALSH, Glass Manufacturer, Birmingham. 6371

JOHNSON & Phillips Motor, 230/240 volts, 32·5 amperes; nearly new. £35.—LAKE, 132, Upper Thames Street, London. 9085

MOTORS, stock soiled, carbon brushes, slot wound armatures, 200—250 volts, guaranteed: 1 H.P., 1900 revs., £6 5s.; 1 H.P. 1200 revs., £7; 1½ H.P. 1200 revs., £8; 2 H.P., 1700 revs., £8.—9021, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

NEW Electric Light Cables, 3/22, 7/25, 3/20, 3/18, 7/22, 7/21½, 7/20, 7/18, 7/16, 7/14, 37/16; 60 per cent. off list.—LAKE, 132, Upper Thames Street, London. 9091

NEW Main Switches, 20 to 100 amps., New Searchlight Projector Lamp, New Voltmeters and Ammeters, New Hammered Brass and Copper Electric Fittings and Hall Lanterns; 66 per cent. off list.—Lake, 132, Upper Thames Street, London. 9087

NINE Electric Motors and Starters by the Diehl Manufacturing Company, 110 volts, five 1-H.P., three 3-H.P., and one 5-H.P. Will be sold separately or in one lot, cheap to clear.—H. H. GARDAM, Staines. 9112

REMINGTON Typewriter, No. 7. New, £11 10s.—LAKE, 132, Upper Thames Street, London. 9090

SINGLE-Phase Motor, 9 H.P., 200 volts, 750 R.P.M., Slip-rings and Commutator, Rails, Starter, and Pulley. Equal new, at half cost price.—9008, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

TWENTY New 12 in. 200, 220 Volt Fans. 24s. each to clear.—ACME Co., 72, Finsbury Pavement, London. 9161

TWO Lahmeyer Dynamos, 1040 amperes, 12 volts; practically new. £35 each.—LAKE, 132, Upper Thames Street, London, E.C. 9084

TYPEWRITER—No. 8 Remington, £9 10s.; No. 10 Barlock, £10 10s.; also Yost Typewriter, £6.—Address, 9162, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FOR SALE.—*(Continued).*

1500 ACCUMULATOR Plates (Traction Type), positive and negatives, new, 8" × 5¼" × ¼" thick, what offers, any quantity.—COOKSON & Co., 37, Endell Street, London, W.C. 9141

5000 NEW Incandescent Lamps, 200 volts, 16-c.p. 3s. 6d. dozen. 3000, various voltage Lamps, 2s. 3d. dozen, to take the lot.—LAKE, 132, Upper Thames Street, London. 9088

ARTICLES WANTED.

WANTED TO PURCHASE FROM ELECTRIC LIGHTING Companies and Electrical Engineers, Dynamos, Motors, Cable, Wire, Instruments, and every description of Electrical Material, also Manufacturers' Surplus Stocks. The bulk being for re-use, high cash prices can be paid.—A. VEREY & Co., Dover. Principal in London three days a week. Telegraphic Address: "Verey, Dover." 8514

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ACCUMULATORS, Second-hand, any type, wanted; also Dynamos and Machinery, Lead Peroxide, Old Copper Cable, Scrap Metals, and every description of Metallic Dross purchased for cash, town or country.—Write A. BROWN & SONS, 142, Lower Clapton Road, N.E. Telephone: 1355 North. 4386

NEW and Old Electrical Stocks, also Old Metal, Cable, Dynamos, Cells, &c., bought for cash.—Lake, 132, Upper Thames Street, London. 9086

OLD Electric Cable, Dynamos, Machinery, Accumulators, Scrap Metals, or any Electrical Machinery purchased for cash in town or country.—Apply to I. LEVY & SONS, 62, Albany Road, Old Kent Road, S.E. Telegraphic Address: "Levisomnus, London." Telephone No. 1747 Hop. 8663

OLD Electric Lamp Ends, Cable and Wire bought for cash.—SMITH & Co., 2, Ranelagh Road, East Ham, London, E. 2818

MOTOR Generator, to buy or hire, 25-KW., 500—240 or 60 volts. Call or state terms to "STEREOMATOS," Franco-British Exhibition. 9198

PLATINUM, in any form and quantity, purchased at highest prices by DERBY & Co., LTD., 44, Clerkenwell Road, London. 6522

WANTED, Electric Lamp Tops and Scrap Platinum.—EDEY AND Co., 29, Ludgate Hill, London. 8756

WANTED, ELECTRICAL REVIEW, Vol. 27 (1890) complete, or No. 675 separate.—Please report to PAUL GOTTSCHALK, Antiquar, Berlin W. 64, Unter den Linden 13. 9187

WANTED, Stampings for small A.C. Motors. Send full particulars and samples. About 100 sets required.—ENGINEER, 5, Reservoir Retreat, Birmingham. 9172

PREMISES & SITES TO LET OR WANTED

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CHARMING modern 10-room 2-storey residence near Acton Green, Chiswick, half acre garden, can be built on if desired, vacant, £60 or sell. Freehold.—MR. HEATHMAN, 10, Parsons Green, Fulham. 9113

FACTORY Site, Chiswick.—10-room Two-storey Modern Residence, half-acre land, Freehold, vacant. Sale or lease.—Freeholder, Mr. HEATHMAN, 10, Parson's Green, Fulham. 9114

(Continued on next page.)

PREMISES & SITES TO LET, &c.—*Continued.*

FACTORY wanted in London, preferably with usual machine tools, to employ 30 workmen.—State full particulars and terms, hire or purchase, to 9134, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

FREEHOLD Factory Site of 8 acres to be sold at Slough, 18½ miles from Paddington. 880 ft. frontage to G.W. Rly. main line; siding could be arranged; low rates, plenty of labour. Price £520 an acre.—For particulars apply J. J. SPRIGGE, Esq., Solicitor, Slough; or LEOPOLD FARMER & SONS, Surveyors and Factory Specialists, 46, Gresham Street, E.C., and Kilburn, N.W. 8761

MISCELLANEOUS.

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EPSTEIN Accumulator Plates for Storage Batteries are now supplied by the sole licensees and makers, W. O. ROOPER AND CO., Electrical Engineers, Stafford. 80

"EMPLOYMENT LIST" sent Free to Employers, for private and confidential introductions of Managers, Draughtsmen, Foremen, Clerks, &c., now wanting berths. Particulars of selected first-class men posted on application.—Write RICHARDSON'S EMPLOYMENT AGENCY (established 1898), 57, St. Paul's Churchyard, London. 8459

SUCCESSFUL Tuition, oral and by post.—ENGINEERING SCHOOL, 78, Cross Street, Manchester. 9143

GOOD Remuneration given for actual test figures and windings, &c., of small A.C. and D.C. motors. Strictly confidential. Particulars and sketches desired.—9173, ELECTRICAL REVIEW, 4, Ludgate Hill, London.

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JOURNAL OF THE INSTITUTION OF ELECTRICAL ENGINEERS.

Edited by G. C. LLOYD, Secretary.

Part 189. Price 5s.

"*Standard Performances of Electrical Machinery.*" (With Discussion.) By Dr. Rudolph Goldschmidt.

"*Protective Devices for High-Tension Transmission Circuits.*" (With Discussion.) By J. S. Peck.

"*The Reluctance of the Air-Gap in Dynamo Machines.*" (With Discussion.) By T. F. Wall, M.Sc., B.Eng.

"*Experimental Determination of the Losses in Pole Shoes, due to Armature Teeth.*" (With Discussion.) By T. F. Wall, M.Sc., B.Eng., and S. P. Smith, B.Sc.

"*The Heat Conductivity of Iron Stampings.*" (With Discussion.) By T. M. Barlow, M.Sc.

"*Direct-Current Generators.*" (With Discussion.) By W. Hoult, M.Eng., B.Sc.

Messrs. E. & F. N. SPON, Ltd., 57, Haymarket, S.W. 9122

NOTICE.

OWING to the many hundreds of replies passing through this Office each week, we would ask those answering Advertisements to be EXTREMELY ACCURATE with regard to the figures WHEN ADDRESSING REPLIES to Box Numbers.

J.H. BUTCHER & CO. TRANSFERS BIRMINGHAM

TRANSFERS

ARE PARTICULARLY SUITABLE FOR MARKING INDICATOR BOARDS, SWITCHES, BELLS, TELEPHONES, DIALS, MOTORS & MACHINERY.

52 to 60, Steelhouse Lane, BIRMINGHAM. (Opposite the General Hospital.

NOTES ON THE PATENTS AND DESIGNS ACT, 1907

By Messrs. LLOYD WISE & CO., Chartered Patent Agents.

Can be obtained from their Offices, 45, Lincoln's Inn Fields, London, W.C. (Price 1s.).

John E. Raworth,

Queen Anne's Chambers, 30, The Broadway, Westminster, S.W. Chartered Patent Agent.

Mr. J. G. LORRAIN, M.I.E.E., M.I.M.E., &c.,

Fellow of the Chartered Institute of Patent Agents,

Norfolk House, Norfolk St., London, W.C.

"PATENTEE'S HANDBOOK." Post Free on Application.

ENGELBERT & CO., London,

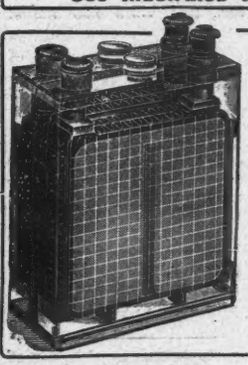
LUBRICANT MANUFACTURERS.

Vide full advertisement in last issue, also next issue.

THE STIRLING BOILER CO., Ltd.,

Head Office: 25, VICTORIA STREET, WESTMINSTER, S.W.

See Illustrated Advertisement last week.



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For IGNITION CELLS, &c.

Stock Sizes from 2" × 1" to 6" × 6"

IMMEDIATE DELIVERY.

Having latest Up-to-Date Lead-burning plant, we can make Immediate delivery of plates burnt up into sets, with lugs and terminals, or burn new plates on to old sets for repairs, &c.

Write for List Section "M."

Archibald J. Wright, Ld.

Manufacturing Electricians,

LEYTON GREEN ROAD, LONDON, N.E.

SWITCHBOARD FRAMES

at Lowest Prices compatible with Highest Class Work.

BROWN & CO.,

WATERLOO SAW MILLS,

73 to 85, McAlpine St., Glasgow.

Telegrams: "Boxes, Glasgow. Telephones: 566, 567 Argyle; 567, P.O.

APPLIED MAGNETISM:

An Introduction to the design of Electro-magnetic Apparatus.

75 Illustrations, Many Original.

7/6

Seven Tables.

By J. A. KINGDON, B.A., Formerly Math. Schol. Pem. Coll., Oxon.

CLOTH. POST FREE.

H. ALABASTER, GATEHOUSE & CO., 4, LUDGATE HILL, LONDON, E.C.

GROWTH OF
KEY FIBRE CONDUIT
FOR UNDERGROUND CABLES.

The Height of the Figures in the above Illustration and the Length of the Conduit carried are, respectively, directly proportional to the Annual Sales of Key Fibre Conduit during the past ten years.

Over 20,000,000 Feet (3,800 Miles)
OF
KEY FIBRE CONDUIT
have already been laid.

THE KEY ENGINEERING CO., LTD.,

4, QUEEN VICTORIA STREET, LONDON. E.C.

Works: Trafford Park, Manchester.

38, DEANSGATE, MANCHESTER.

GLOVER'S CABLES.

[Entered at Stationers' Hall.]

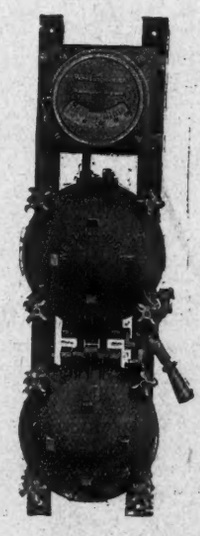
"I'M ON A GOOD THING"

DANGER-PROOF

A.-C. & D.-C. SWITCHGEAR

[Up to 600 volts]

FOR FIERY MINES



WESTINGHOUSE flame-tight, explosion-proof switch- and fuse-boxes are designed to withstand internal explosion of gaseous mixtures without danger of external explosions, and the very rough usage common in collieries and mines. Switchgear of this design has been in successful practical operation, in dangerous locations, for the past two years. Please write for a copy of Supply List No. 38, to the

SUPPLY DEPARTMENT

Westinghouse
Manchester

Evershed's Megger.

Bridge Megger.

Observe the White Stars; they mark our Agencies all over the World.

Head Office and Works:

ACTON LANE, CHISWICK, LONDON, W.

Telegrams:—
"DOROTHEA, LONDON."

Telephone:—
Hammersmith 221.

Switchboard Instruments.

Portable Instruments.

S. D. & Co.

LIFTS

The Controller of this machine is instantly accessible at every point.

To deal with one point you need not dismount twelve others.

A. SMITH & STEVENS, Battersea, London.

THOMAS HIGH TENSION INSULATORS.

EUROPEAN AGENT: **J. W. GLADSTONE.**

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Office and Showroom:
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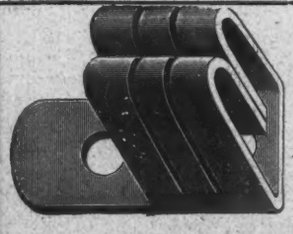
KIRCHOFF'S LAWS
AND THEIR APPLICATION.
Paper Covers. 1s. 6d. Post Free.
By E. C. RIMINGTON.
H. ALABASTER, GATEHOUSE & CO., 4, Fudgate Hill, London, E.C.



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FOR
ELECTRICAL TRADES.

A. E. HARRIS & CO.,
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Protection of English Trade.

ENGLAND CHINA AND FANCY

All goods made by Members of the China Furniture and Electrical Fittings Manufacturers' Association are marked with above Trade Mark, WHICH IS A GUARANTEE OF ENGLISH MANUFACTURE.

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Whitehall Works, Longport, Stoke-on-Trent.
J. MACINTYRE & CO., LTD.,
Washington Works, Burslem.
BULLERS, LTD.,
6, Laurence Pountney Hill, Cannon Street, London, E.C.

DISPLAYED ADVERTISEMENTS.

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The ELECTRICAL REVIEW is the recognised medium of the Electrical Trades, and has BY FAR THE LARGEST CIRCULATION of any Electrical Industrial Paper in Great Britain.

Illustrated. XI. Tables.

SECONDARY BATTERIES

A PRACTICAL HANDBOOK FOR OWNERS & ATTENDANTS.

4s. Post Free.

BY AN ENGINEER.

H. ALABASTER, GATEHOUSE & CO.,
4, LUDGATE HILL, LONDON, E.C.

. . THE . .

Post Office Electrical Engineers' Journal.

A QUARTERLY JOURNAL.

CONTENTS FOR JULY, 1908.

FRONTISPIECE:
Some of the Engineering Staff, Irish Districts.

EDITORIAL:
Examinations.
Sir W. H. Preece, K.C.B., F.R.S.
Finance.
Types of Underground Cable.

EDUCATION:
Education and Training of Telegraph Engineers in France. Major W. A. J. O'Meara, C.M.G.

TELEGRAPHS:
The Motor-Driven Wheatstone Transmitter. C. C. Vyle and E. V. Smart.

CONSTRUCTION:
The Design of Telephone and Telegraph Cables. A. G. Lee, B.Sc.
Pneumatic Tube Joints. W. N.
Reminiscences of Underground and Overhead Telegraph Works. G. W. Hook.
Potheads, and Pothead Insulators. E. Gomersall.
Telephoning of London. W. Noble, A.M.I.E.E.

TELEPHONES:
Richmond Telephone Exchange: New C.B. Equipment. J. W. Turner, A.I.E.E.

FINANCE:
Army Finance: Abstract of Lecture by Charles Harris.

WIRELESS:
The Radio-Telegraph Convention—and After.
Plane Electro-Magnetic Waves—Relation to Wireless Telegraphy. J. Zenneck. Translated by H. Hartnell, A.M.I.E.E.

INSTITUTION NOTES:
Proceedings of Council.
Annual Report.
Local Centre Notes.

SOCIAL:
Sports. Chess Club Notes. Visit to Manufacturer's Works, &c.

CORRESPONDENCE.
STUDENTS' SECTION.
STAFF CHANGES.
OBITUARY:
Thomas William Lapham (W.B.).
Henry Pomeroy (T.P.).

PUBLISHERS:
H. ALABASTER, GATEHOUSE & CO., 4, Ludgate Hill, E.C.
Price, Single Copies, 1s. 3d. post free.
Annual Sub. 4s. paid in advance.

OFFICIAL NOTICES.

Latest time for receiving, 9.30 a.m. Thursday.

DEMONSTRATION.

THE WARNER TRUCK.

BY kind permission of Mr. H. E. BLAIN, General Manager the West Ham Corporation Tramways, a car equipped with the Warner Steering Control may be inspected at 11.30 a.m. on MONDAY NEXT, JUNE 29th, at GREENGATE DEPOT, PLAISTOW, E. (D. Ry. Station). 9196

BOROUGH OF ST. PANCRAS.

THE ST. PANCRAS BOROUGH COUNCIL invite Tenders for the Additions to be made to their Low Tension Switchboard at the King's Road Generating Station.

Copies of the Specification, Conditions of Contract and Form of Tender can be obtained upon application at the Electricity Department Offices, No. 57, Pratt Street, Camden Town, N.W., on payment of a deposit of £1 1s., which will be refunded only on the Specification being returned accompanied by a *bond fide* tender.

Tenders to be sent to the undersigned, endorsed "Tender for Additions to Switchboard," by 12 o'clock noon on MONDAY, JULY 13th, 1908.

The Council do not bind themselves to accept the lowest or any tender.

C. H. F. BARRETT,
Town Clerk.

Town Hall,
Pancras Road, N.W.,
June, 1908. 9123

METROPOLITAN BOROUGH OF ISLINGTON.

COOLING TOWER.

THE LIGHTING COMMITTEE invite Tenders for the supply, delivery, and erection complete of a natural-draught Cooling Tower, in accordance with the Specification, copy of which may be obtained, on or after July 1st, upon application to the CHIEF ENGINEER, Electricity Works, Eden Grove, Holloway, N.

Tenders must be submitted on the prescribed form, sealed, and endorsed "Tender for Cooling Tower," and forwarded to the undersigned not later than 12 noon on THURSDAY, the 16th JULY, 1908.

The Council does not bind itself to accept the lowest or any Tender.

WM. F. DEWEY,
Town Clerk.

Town Hall,
Upper Street, N.,
June 24th, 1908. 9170

METROPOLITAN BOROUGH OF WOOLWICH.

ELECTRICITY DEPARTMENT.

THE COUNCIL OF THE ABOVE BOROUGH invite Tenders for the Equipment of their Globe Lane Generating Station with COAL-HANDLING PLANT.

Persons or Firms desirous of Tendering may obtain a copy of the Specification and Form of Tender on application at the Office of the Borough Electrical Engineer, Town Hall, Woolwich.

The Person or Firm whose Tender is accepted will be required to pay Trades Union rates of wages and to observe Trades Union hours of labour, and to enter into a formal contract.

Sealed Tenders, with Schedules properly filled in on the Official Forms provided, must be delivered to me at the Town Hall, Woolwich, not later than Twelve Noon, on THURSDAY, the 23rd JULY, 1908, in envelope, endorsed "Tender for Coal-Handling Plant."

The Council do not bind themselves to accept the lowest or any Tender.

By order,
ARTHUR B. BRYCESON,
Town Clerk.

Town Hall,
Woolwich,
11th June, 1908. 9007

(Continued on page 41.)

2000

TONS OF COAL

HAVE BEEN SAVED

IN

ONE YEAR.

by the Installation of an

INSTANTLY REVERSIBLE

ENTZ BOOSTER

and Battery of

"Chloride Accumulators."

WRITE FOR PARTICULARS.

The Chloride Electrical Storage Co., Ltd.,

Clifton Junction,

MANCHESTER.

OFFICIAL NOTICES.—*Continued from page 39.*

CORPORATION OF DUBLIN.

THE LIGHTING COMMITTEE of the Corporation of Dublin are prepared to receive Tenders for the Supply and Erection of Sub-station Switchboards, Transformers, and Accessories.

Specification, with General Conditions and Form of Tender, can be obtained from the City Electrical Engineer, Fleet Street, Dublin, on and after 29th June, 1908, on payment of One Guinea for each Specification, which will be returned on receipt of a *bond fide* tender.

Tenders, addressed "Chairman of the Lighting Committee, 3, Cork Hill, Dublin," and marked "Tender for Sub-station Switchboards, Transformers, &c.," to be received not later than noon on JULY 13th, 1908.

The Corporation do not bind themselves to accept the lowest or any tender, and reserve the right of accepting a tender for any section separately if found desirable.

FRED J. ALLAN,
Secretary.

Lighting Committee Offices,
3, Cork Hill, Dublin,
June 22nd, 1908. 9120

CORPORATION OF DUBLIN.

THE LIGHTING COMMITTEE of the Corporation of Dublin are prepared to receive Tenders for the Supply and Erection of Boiler Plant, &c., at their Pigeon House Generating Station.

Specification, with General Conditions, and Form of Tender, can be obtained from the CITY ELECTRICAL ENGINEER, Fleet Street, Dublin, on and after June 29th, 1908, on payment of One Guinea for each Specification, which will be returned on receipt of a *bond fide* tender.

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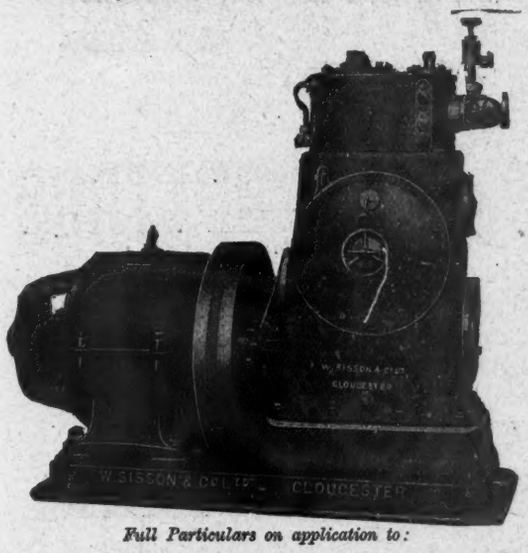

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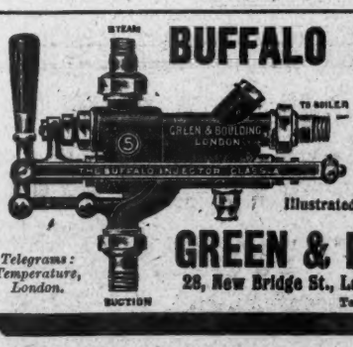

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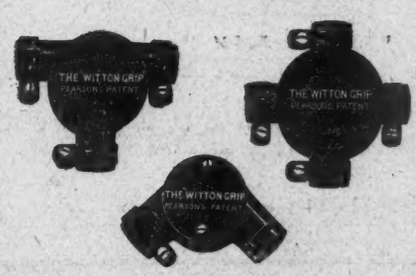

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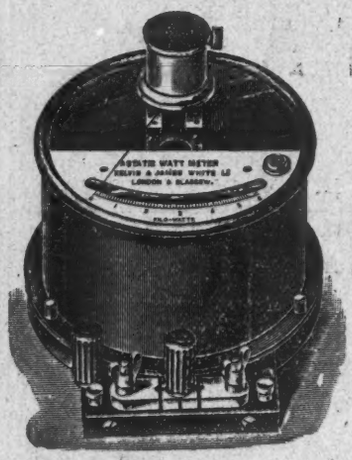

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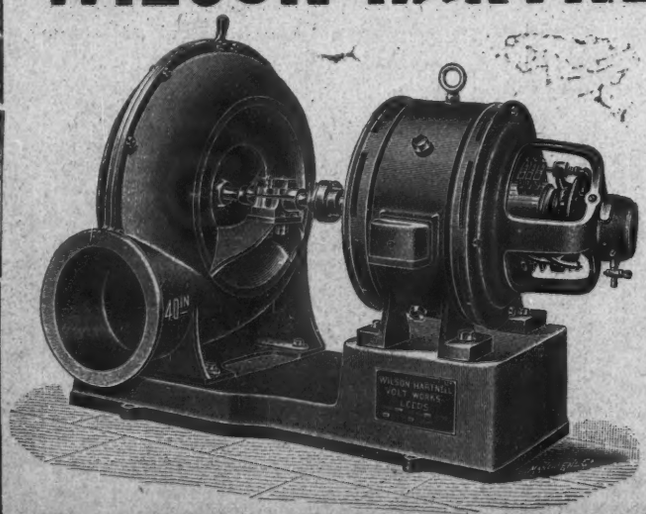

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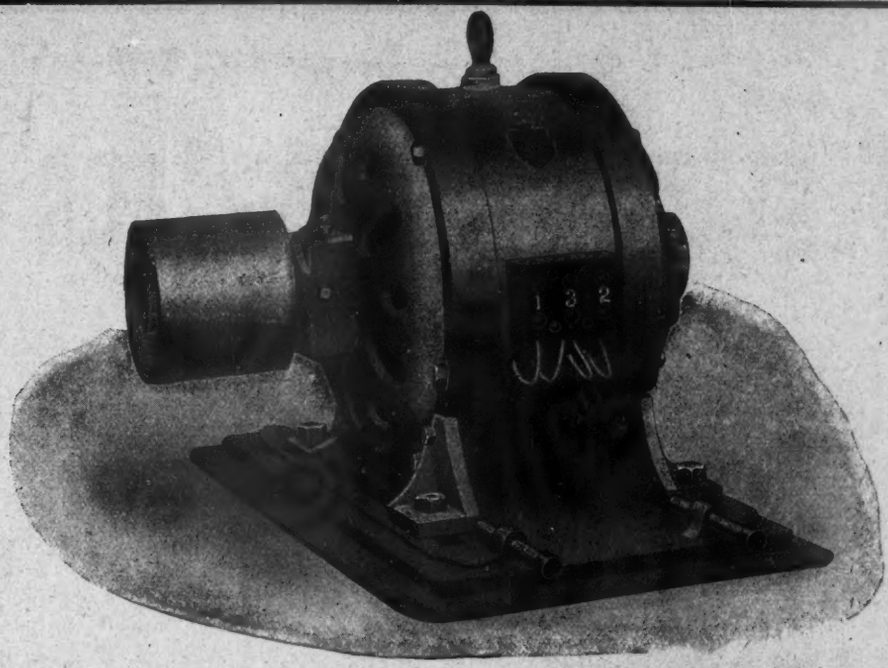

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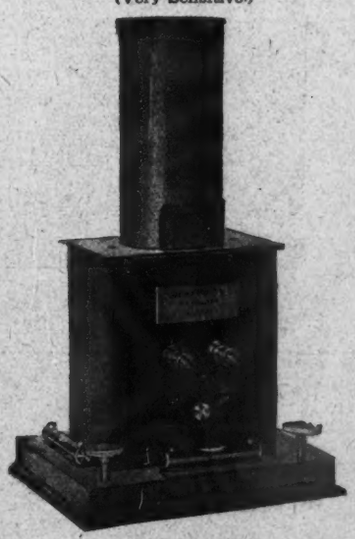

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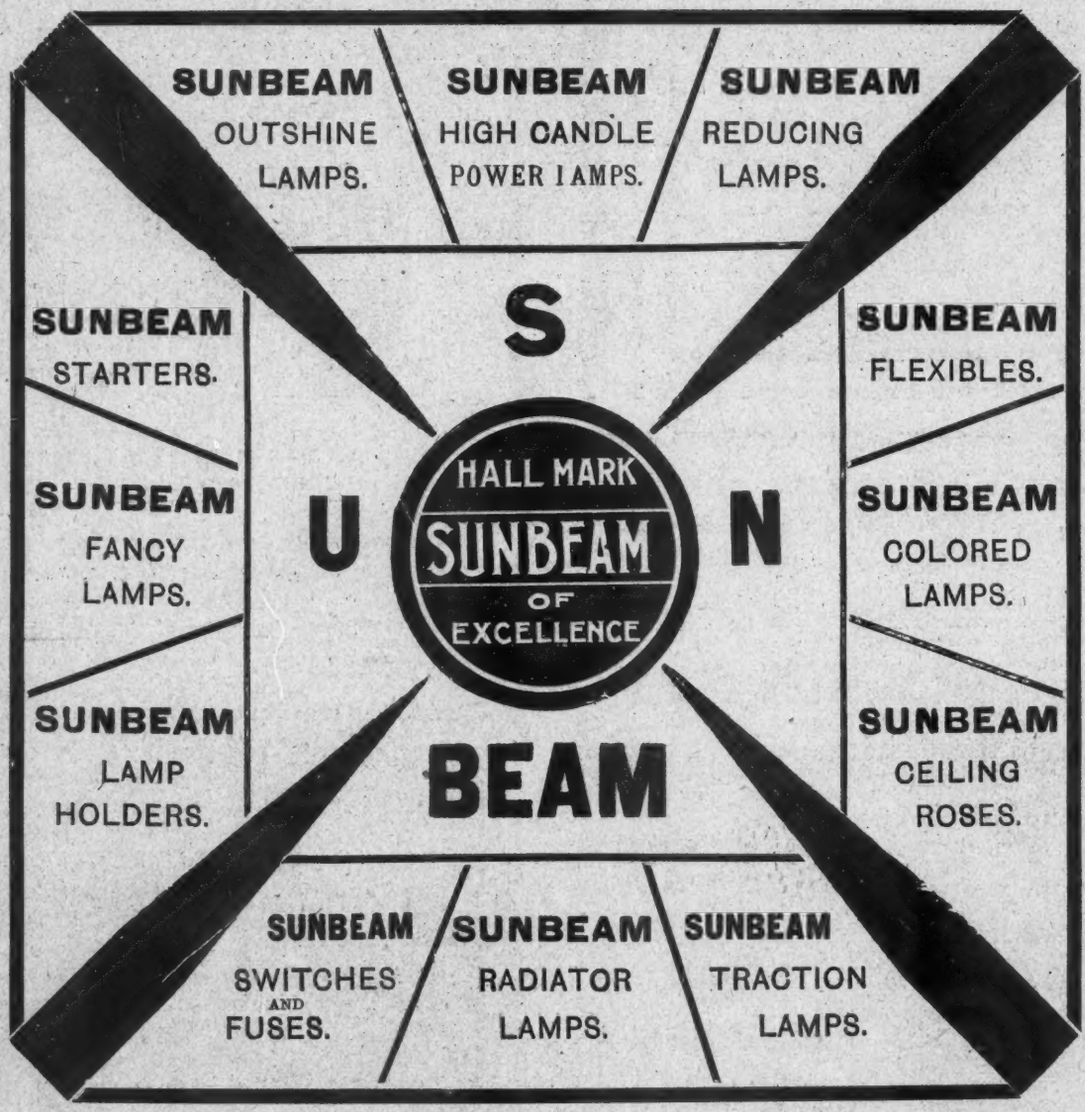

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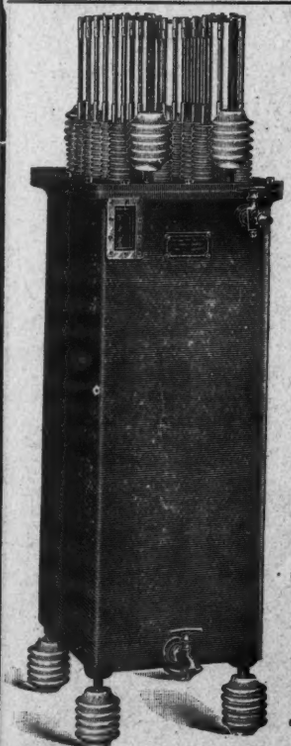

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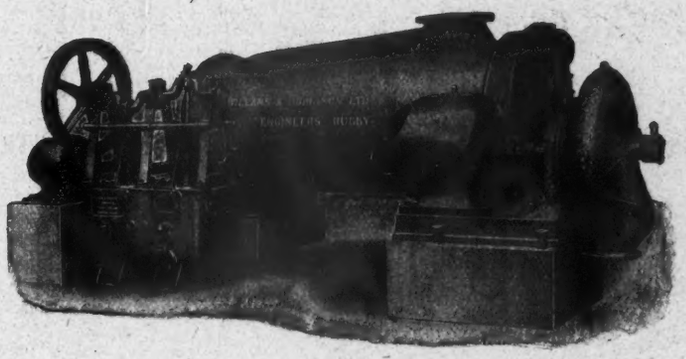

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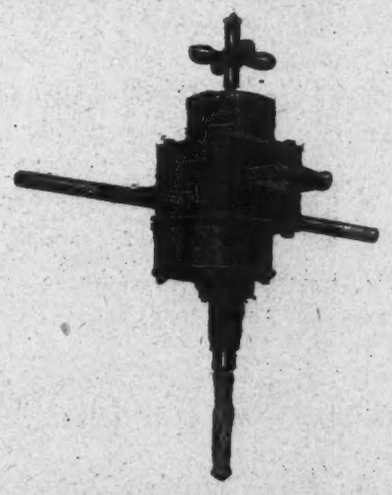

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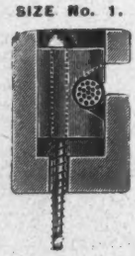

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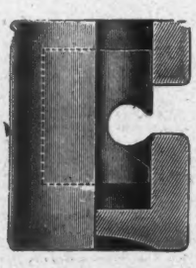

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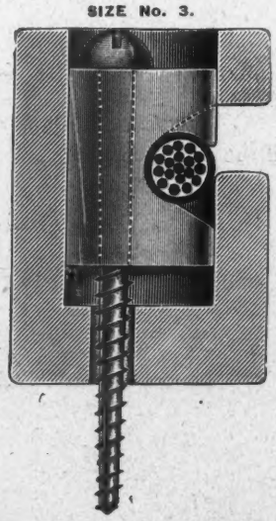

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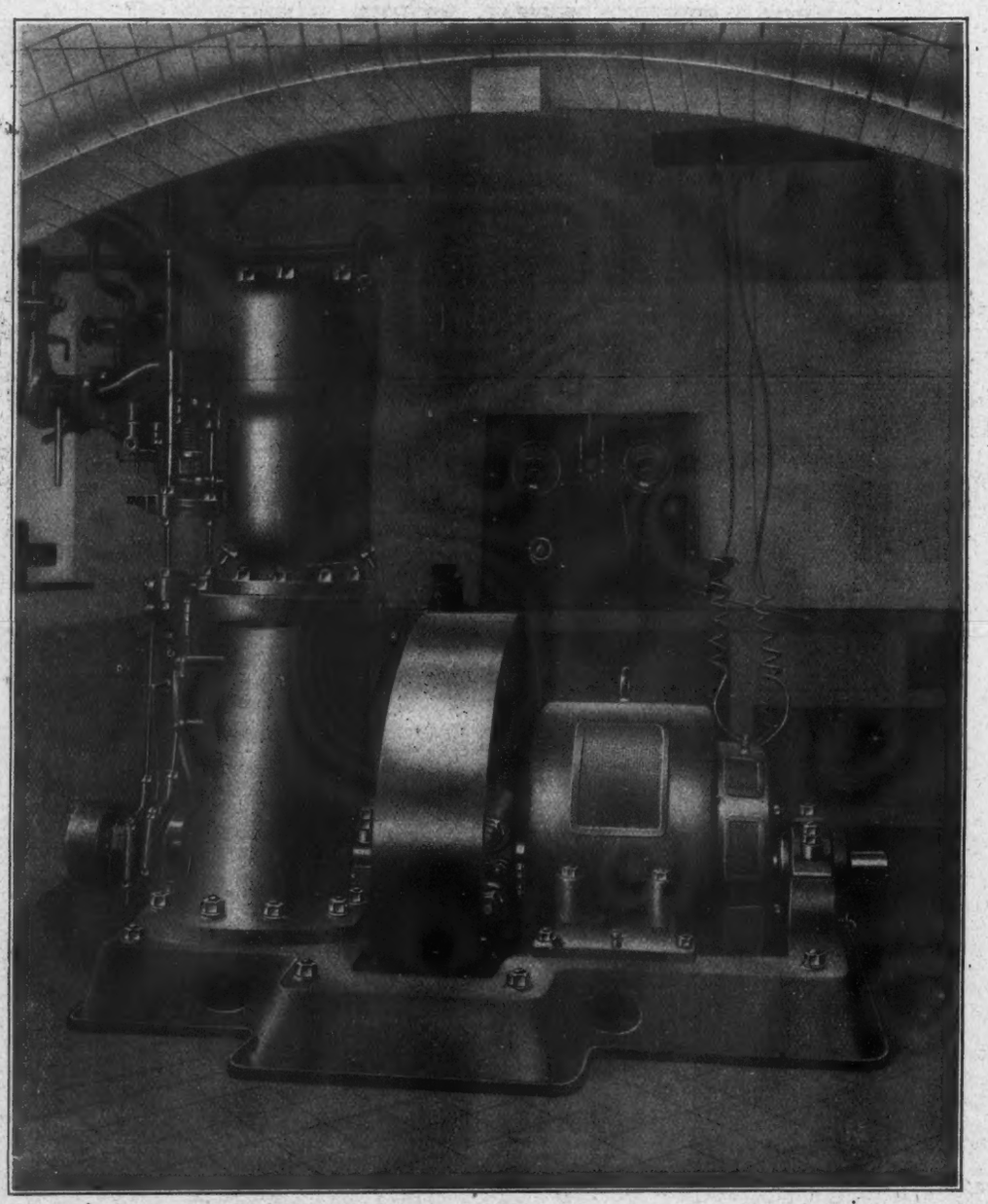

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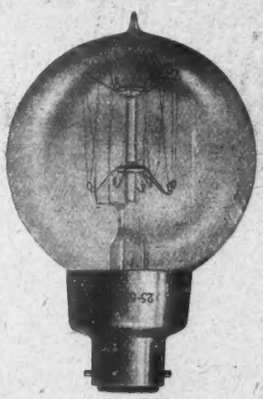

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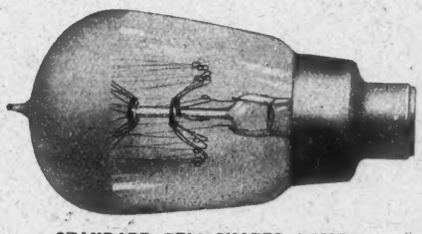

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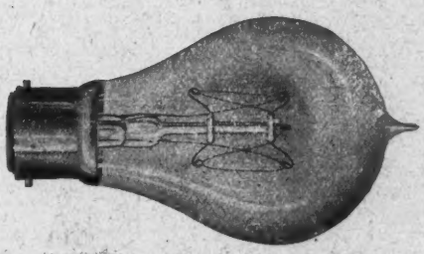

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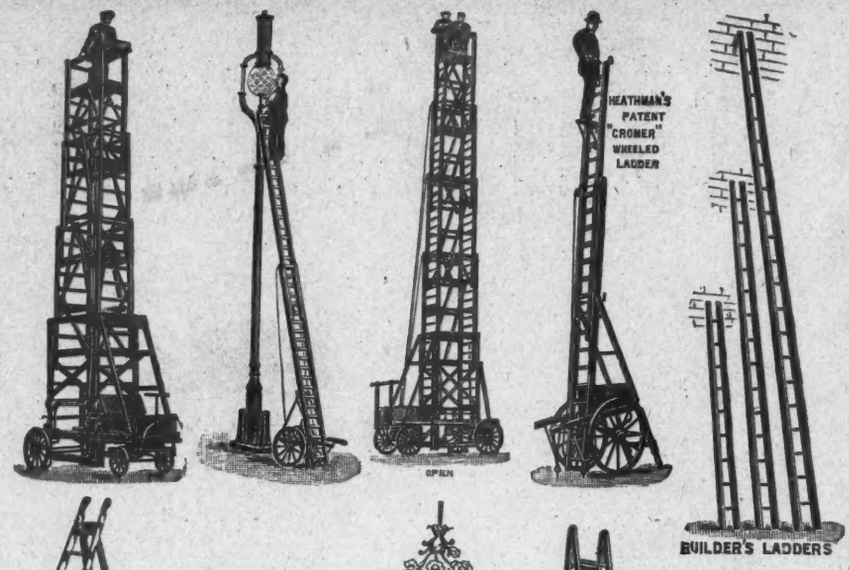

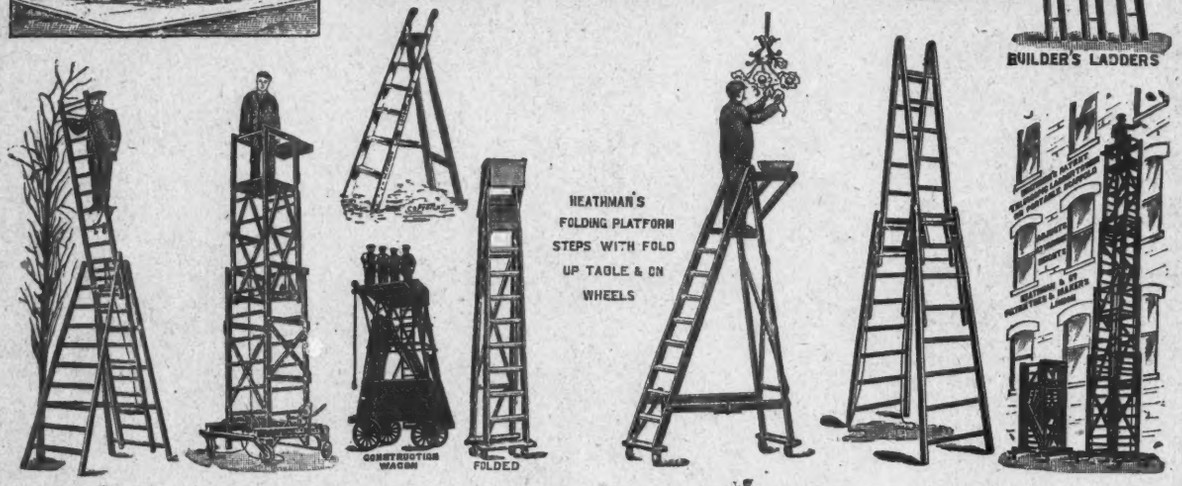

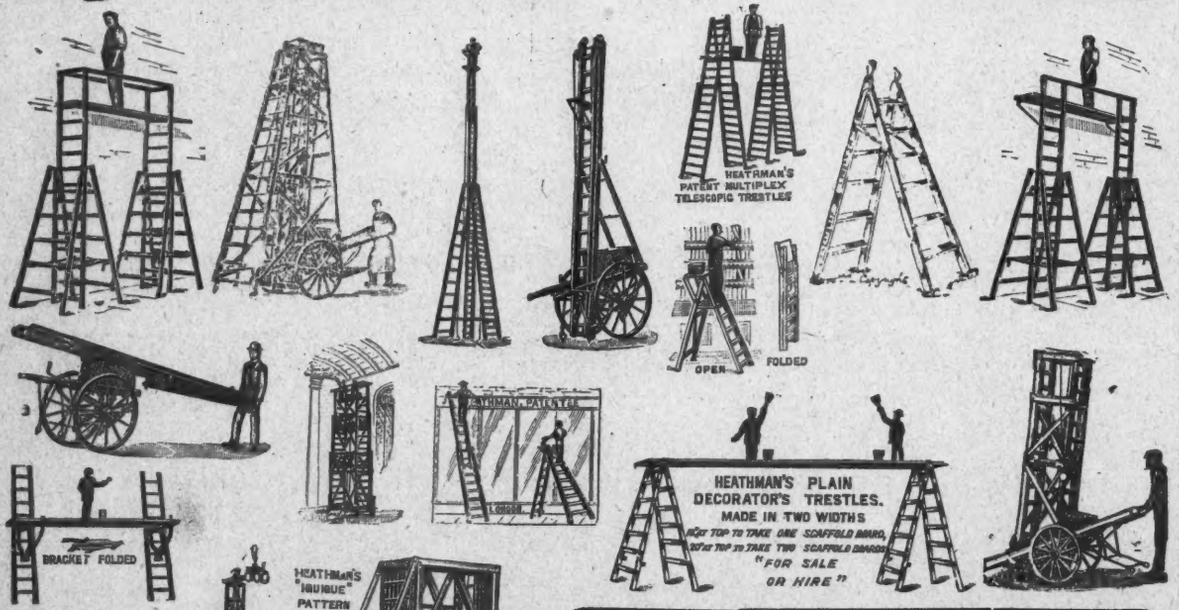

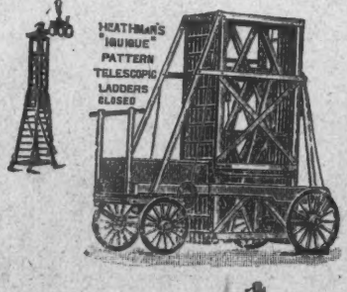

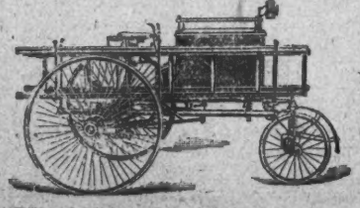

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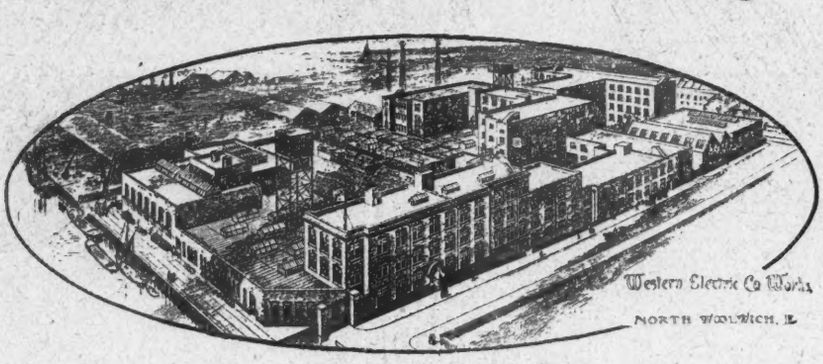

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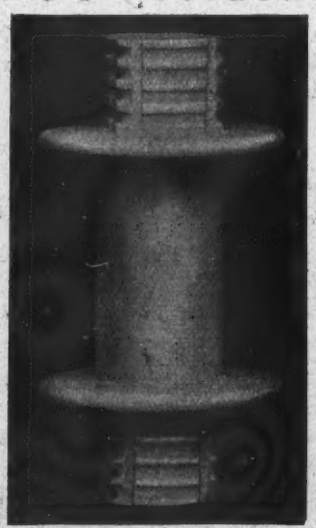

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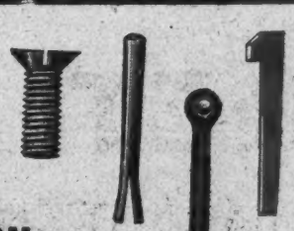

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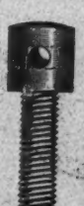

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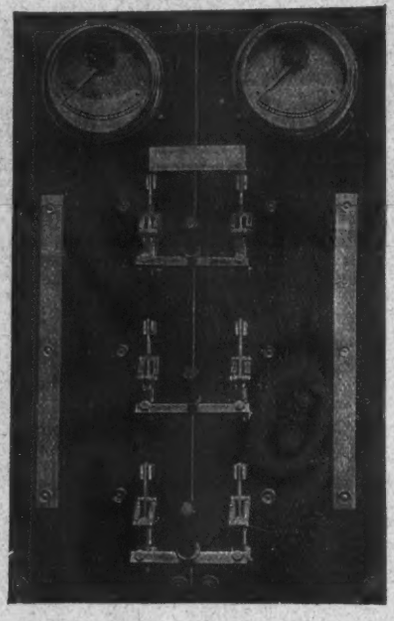

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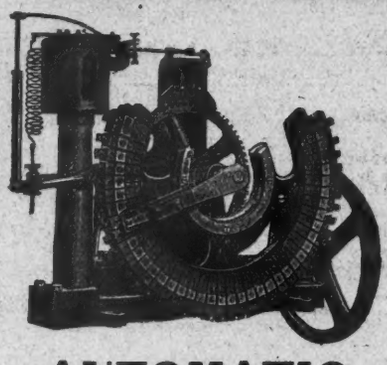

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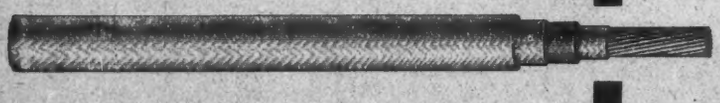

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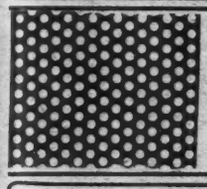

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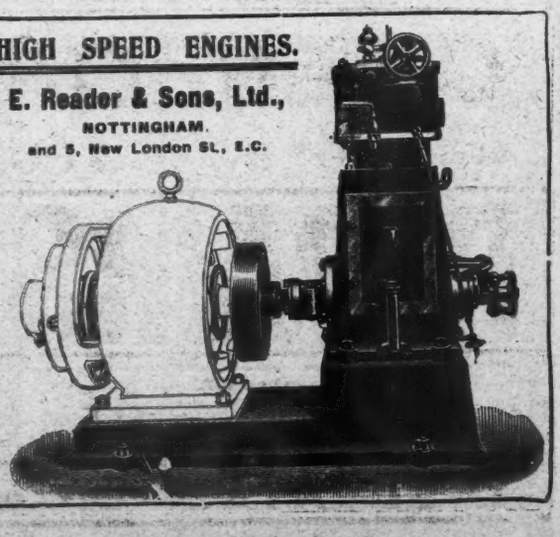

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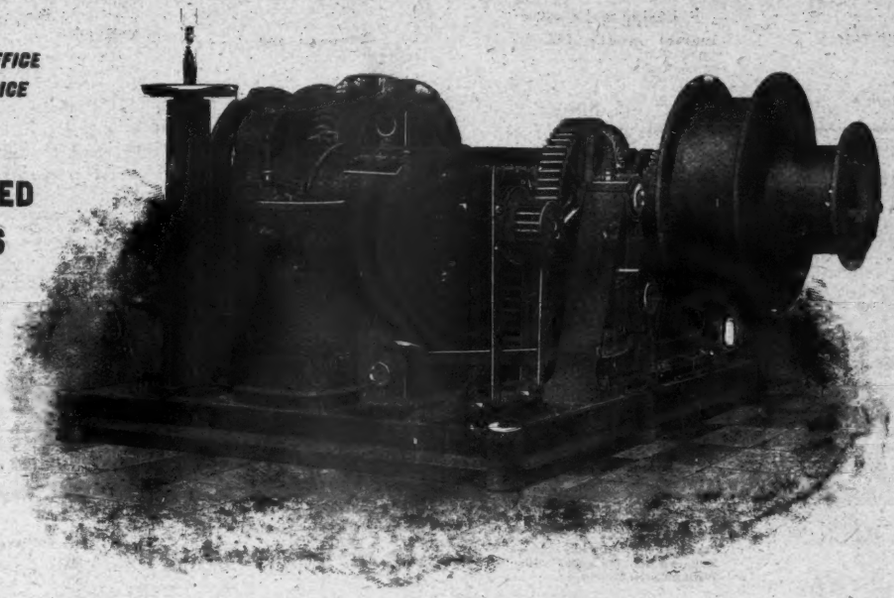

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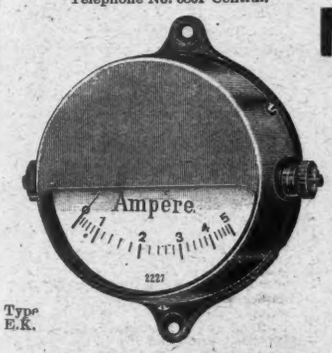

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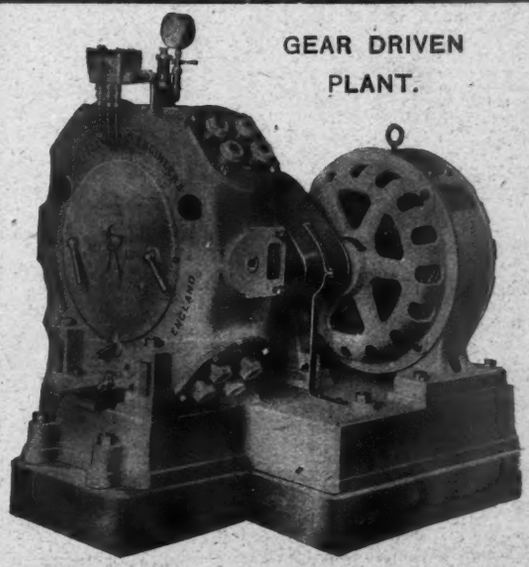

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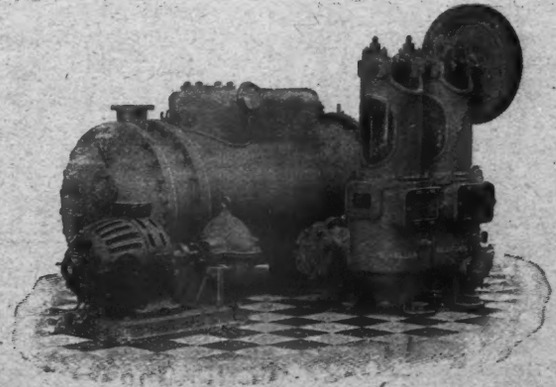

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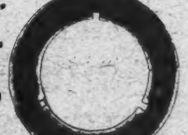

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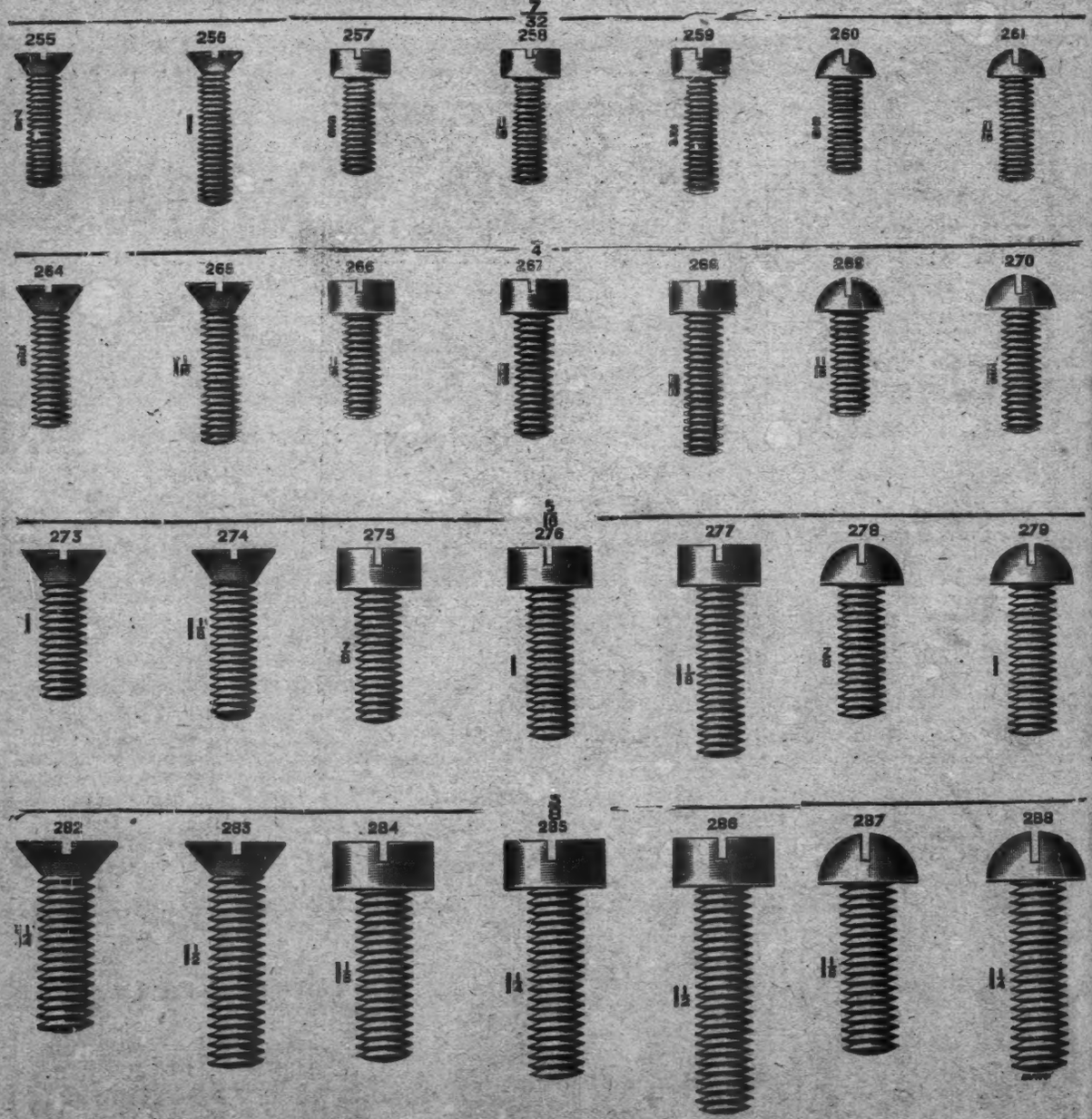

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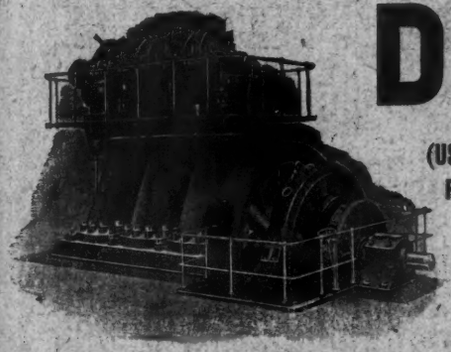
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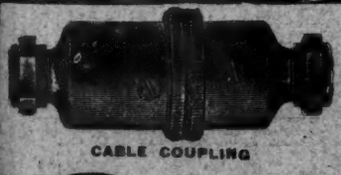
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